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Jenny Larsen — 7-20-2004
Jenny Larsen — Date

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of : HONEYWELL INTERNATIONAL, INC. — Docket No. H25210

Serial No. : 09/832,965 — Art Unit No. 2871

Filing Date : April 11, 2001 — Examiner: Dung T. Nguyen

Invention Title: POLARIZED DISPLAY WITH WIDE ANGLE ILLUMINATION

APPELLANT'S APPEAL BRIEF

To: Mail Stop Appeal Brief – Patents
Commissioner of Patents
PO Box 1450
Alexandria, VA 22313-1450

Honorable Assistant Commissioner for Patents:

As provided in 37 C.F.R. § 1.192, Appellant files this Appeal Brief in triplicate in connection with the above-identified application with the Board of Patent Appeals and Interferences ("Board").

The requisite government fees provided for in 37 C.F.R. § 1.17(c) for a large entity are in the amount of $330.00 for filing this Appeal Brief, and are hereby authorized to be withdrawn from the Deposit Account Number 01-2335 for Dennis F. Armijo, P.C., and the Commissioner is hereby authorized by this paper to charge any additional fees to Account Number 01-2335 for Dennis F. Armijo, P.C., and any overpayments should be credited to Account Number 01-2335.

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(1) Real Party in Interest

The real party in interest is Honeywell International, Inc.

(2) Related Appeals and Interferences

No other appeals or interferences will directly affect, be directly affected by, or have a bearing on the Board's decision in this appeal.

(3) Status of Claims

Claims 1-13 and 15-24 are pending in the present application and have been finally rejected and are the basis for this appeal. Claim 14 was canceled. The pending claims are attached as Appendix A.

(4) Status of Amendments

The amendment dated December 22, 2003, was entered; however no claims were amended. The affidavit of Brent Larson, PhD., submitted on December 22, 2003, was entered by the Examiner in the Advisory Action of May 4, 2004. The latest version of the amended claims was entered on July 28, 2003. The claims from this amendment are reflected in Appendix A.

(5) Summary of the Invention

The present invention comprises an apparatus and method for improving the brightness of a polarized display at viewing angles off of the vector normal to the display.

In most devices suitable for use with the present invention, optical elements are proximate the exterior of the polarized display. Examples of such elements

range from complex reflective polarizers and prismatic films, which provide brightness enhancement, to simple substrate-to-air interfaces to provide containment or protection.

Both the imaging characteristics of the polarized display and the angular illumination or transmission profiles of the optical element(s) (including interfaces) can be highly polarization dependent, and are generally not simultaneously optimized. The present invention recognizes this opportunity and provides a linear-to-linear polarization rotation to decouple the polarization constraint from certain other design objectives, resulting in a system with improved illumination profile along a desired plane or axis.

Claim 1 combines a direct view polarized display panel and an external polarization rotator to provide an expanded angle of illumination in a desired plane, and is well supported by Figs. 2, 3, 4, 5, 9 and the accompanying discussion. In particular, Fig. 4 (along with p. 16, lines 8-24) directly supports claim 1 in its most general form, where the use of the polarization rotating element(s) 430 and/or 440 aligns the polarization to minimize off-axis reflection losses along the desired axis 422, thereby providing an expanded angle of illumination along that axis. The polarization rotation element is described on p. 12, line 14 through p. 13, line 18; linear to linear polarization rotation is explicitly supported on p. 18, lines 11-18, and one exemplary rotation element design is provided in Fig. 6 and the associated description. The drawing references are:

1. A polarized display device (200, 300, 400, 500, 900) having an expanded angle of illumination (210, 310, 348) for optimizing a viewing angle (220, 320, 420, 520) in a desired plane (222, 322, 422) comprising:

a direct view polarized display panel (202, 302, 402, 502, 902); and

a transmissive polarization rotating element (230, 330, 340, 430, 530, 630, 930) proximate to an exterior surface of the polarized display panel, wherein said transmissive polarization rotating element rotates light polarization between a

first linear polarization orientation (232, 332, 342, 532) and a second linear polarization orientation (236, 336, 322, 536).

Claim 17 provides an improved polarization sensitive scattering element (PSSE), wherein the preferred illumination angles can be selected without constraining the design of the polarized display device. This is directly supported by FIG. 2, p. 14, lines 7-11 and p. 13, lines 21-23, as well as by the element numbers in the drawings as identified in claim 1 above.

The method in claim 19 is directly supported by the description in p. 12, lines 1-12 and contains similar elements in the drawings as identified in claim 1 above.

(6) Issues

I

WHETHER CLAIMS 1-3, 5-8, 10, 12-13, 15-16 AND 19-24 ARE UNPATENTABLE UNDER 35 U.S.C. § 102(e) AS BEING ANTICIPATED BY SHARP, ET AL. (U.S. Patent No. 5,999,240)

II

WHETHER CLAIM 4 IS UNPATENTABLE UNDER 35 U.S.C. § 103(a) OVER SHARP, ET AL. (U.S. Patent No. 5,999,240)

III

WHETHER CLAIMS 9, 11 AND 17-18 ARE UNPATENTABLE UNDER 35 U.S.C. § 103(a) OVER SHARP, ET AL. (U.S. Patent No. 5,999,240), IN VIEW OF LARSON (U.S. Patent No. 5,751,388)

(7) Grouping of Claims

There are two groups of claims. Group I, consisting of claims 1-3, 5-8, 10, 12-13, 15-16, and 19-24, as identified by the Examiner in paragraph 2 of the final office action, stand or fall together. Claim 4 was rejected individually; however it is

a dependent claim and therefore stands or falls with independent claim 1. Group II, consisting of claims 9, 11 and 17-18, as identified by the Examiner in paragraph 5 of the final office action, stand or fall together.

(8) Arguments

Note that copies of the references relied upon by the Applicant are contained in Appendix B.

A. 35 USC § 102(e): Sharp et al., (US Patent No. 5,999,240)

Claims 1-3, 5-8, 10, 12-13, 15-16, and 19-24 were rejected under 35 USC § 102(e) as being anticipated by Sharp, et al., (US Patent No. 5,999,240). Independent claims (claims 1, 17, 19 and 23) specifically claim the feature of a polarization rotating element external to a display panel. In addition, the Applicant also pointed out to the Examiner that a mere variable retarder is not the same as a "polarized display panel" as described in the specification. In addition, the affidavit of Brent Larson, PhD., an expert in the art, specifically stated that Sharp disclosed and described a variable retarder throughout the specification and the claims and the variable retarder cannot, and does not function similarly as the described polarized display panel of the present invention. In addition, Dr. Larson specifically stated that a person skilled in the art would not consider the polarized modulator of Sharp to be the same element, or function the same as the polarized display panel of the present invention. In addition, the polarized display panel as defined in the specification of the patent application confirms this contention. This contention has not been refuted or even addressed by the Examiner.

The specific rejection in the final office action of October 16, 2003 states:

> Claims 1-3, 5-8, 10, 12-13, 1-16 and 19-24 are rejected under 35 U.S.C. 1-2(e) as being anticipated by Sharp, et al., US Patent No. 5,999,240. The above claims are anticipated by Sharp et al. figure 2a which discloses a display device comprising:
> a direct view polarized display panel (LCD 10);
> a transmissive polarization rotating element (retarder 20 and/or 30) formed in front and an exterior surface of the polarized display panel (10) as claimed for rotating linear light between a first polarization orientation and a second polarization orientation (see light path: incoming vertically light F and outgoing light rotating 45 degrees);
> an optical element (polarizing film 40).

A similar rejection was made by the Examiner in his office action of May 8, 2003. Again, the Applicant traversed the rejection in the response of July 28, 2003, and specifically indicated that the Examiner's conclusion that the "active matrix FLC" of Sharp is similar to the "polarized display panel" as described and claimed in the pending patent application was erroneous. Again, the Examiner did not refute or address the Applicant's contention.

Sharp (US Patent 5,999,240), FIG. 2a, shows a polarization modulator, 10 (e.g., a liquid crystal cell), with front and rear polarizers, 40 and 50, and polarization rotating elements 20 and 30. Note, however, that the polarization rotating elements are retardation films contained internally to the polarized display device, which consist of all of the elements of FIG. 2a. As specifically explained and argued by the Applicant, as well as in the affidavit of Brent Larson, PhD., a variable retarder does not provide polarized display panel functionality on its own. It requires the additional polarizers. In the Applicant's responses of July 28, 2003, and December 22, 2003, the Applicant provided a number of references to the specification to support that definition of "polarized display panel" as used in the present claims and described the errors of the Examiner's conclusions.

When including the additional polarizers of FIG. 2a of Sharp with the liquid crystal cell 10, in order to meet the definition of a "polarized display panel", it is crystal clear that the polarization rotating elements 20 and 30 are not proximate to the exterior of the polarized display panel. Rather, they are clearly inside of the polarized display panel, and thereby quite distinct from Applicant's claimed invention. Again, this is discussed in detail in the affidavit of Dr. Larson. Again the Examiner did not refute or discuss the Applicant's traversal, but merely reiterated his unsubstantiated conclusion.

As, set forth in Dr. Larson's affidavit, the term LCD is typically used in the art to refer to a Liquid Crystal Display, where a display is a device or system capable of displaying information in a manner suitable for viewing. Sharp, however, uses "LCD" more broadly, to the point of being indefinite. See column 11, lines 30-37, "the term LCD is used for any liquid crystal device which contains a liquid crystal cell having one or more pixels". He goes on to provide useful limitations on modulator 10, however, by saying "The LCD is typically a multi pixel array of liquid crystal cells where each pixel can be independently controlled." No mention is made of any polarizers being included with the cells in the LCD, or its ability to modulate any property of light other than polarization. As further evidence that Sharp is using the term LCD to describe a variable retarder or similar polarization modulator, lines 36-37, states that "The retardances of a single pixel of an LCD are labeled in FIG. 2"

Further, as provided in the uncontroverted affidavit of Dr. Larson, it is readily evident to one skilled in the art that the described utility of Sharp's invention in Fig. 2a requires that element 10 function as a polarization modulator, thereby making it distinctly different from the "polarized display panel" of the present invention.

Several other references to modulator 10 support its role as a variable retarder which modulates polarization. Column 7, lines 45-47 states that "Polarization modulator 60 is formed by modulator 10 in combination with retarder

stack 20". Using the polarized input light from polarizer 40, and adding polarization analyzer 70, forms a filter (column 7, lines 47-50), which modulates intensity of the light (see column 10, line 47). Note that "analyzer" is a term often applied to a polarizer, which is used to convert polarization modulation (which is not visible to the eye) into intensity or amplitude modulation.

In the context of Fig. 1, column 7, lines 60-65 teach that light of one polarization is transmitted with a polarization that does not vary with the voltage applied, while light with another polarization is modulated into a different polarization. Column 7, line 66 through column 9, line 15 goes on to describe various types of suitable polarization modulator types, and include the introductory statement "The modulator is a device which controls the state of polarization of transmitted light with the application of a voltage". This is extended to modulator 10 of Fig. 2 in column 10, lines 56-59. In other words, the modulator 10 of Sharp is not a polarized display panel according to the present invention, and therefore does not anticipate any of the claims of the present invention.

Thus, the independent claims differ significantly than the teaching of Sharp, et al., and are allowable. The dependent claims are also allowable due to the allowablity of the independent claims.

Perhaps the Examiner is relying on his own knowledge or official notice in reaching his conclusions that the LCD of Sharp is similar to the "polarized display panel" of the present invention, and that Sharp's device discloses a polarization rotating element proximate to an exterior surface of the polarized display panel, despite the contrary arguments posed by the Applicant. Official notice without documentary evidence to support an examiner's conclusion is permissible only in some circumstances. While "official notice" may be relied on, these circumstances should be rare when an application is under final rejection or action under 37 CFR 1.113. Official notice unsupported by documentary evidence should only be taken by the examiner where the facts asserted to be well-known, or to be common

knowledge in the art, are capable of instant and unquestionable demonstration as being well-known. As noted by the court in In re Ahlert, 424 F.2d 1088, 1091, 165 USPQ 418, 420 (CCPA 1970), the notice of facts beyond the record which may be taken by the examiner must be "capable of such instant and unquestionable demonstration as to defy dispute" (citing In re Knapp Monarch Co., 296 F.2d 230, 132 USPQ 6 (CCPA 1961)). In Ahlert, the court held that the Board properly took judicial notice that "it is old to adjust intensity of a flame in accordance with the heat requirement." See also In re Fox, 471 F.2d 1405, 1407, 176 USPQ 340, 341 (CCPA 1973) (the court took "judicial notice of the fact that tape recorders commonly erase tape automatically when new 'audio information' is recorded on a tape which already has a recording on it"). In appropriate circumstances, it might not be unreasonable to take official notice of the fact that it is desirable to make something faster, cheaper, better, or stronger without the specific support of documentary evidence. Furthermore, it might not be unreasonable for the examiner in a first office action to take official notice of facts by asserting that certain limitations in a dependent claim are old and well known expedients in the art without the support of documentary evidence provided the facts so noticed are of notorious character and serve only to "fill in the gaps" which might exist in the evidentiary showing made by the examiner to support a particular ground of rejection. In re Zurko, 258 F.3d 1379, 1385, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001); Ahlert, 424 F.2d at 1092, 165 USPQ at 421.

It would not be appropriate for the examiner to take official notice of facts without citing a prior art reference where the facts asserted to be well known are not capable of instant and unquestionable demonstration as being well-known. For example, assertions of technical facts in the areas of esoteric technology or specific knowledge of the prior art must always be supported by citation to some reference work recognized as standard in the pertinent art. In re Ahlert, 424 F.2d at 1091, 165 USPQ at 420-21. See also In re Grose, 592 F.2d 1161, 1167-68, 201 USPQ 57, 63 (CCPA 1979). ("[W]hen the PTO seeks to rely upon a chemical theory, in establishing a prima facie case of obviousness, it must provide evidentiary support

for the existence and meaning of that theory."); In re Eynde, 480 F.2d 1364, 1370, 178 USPQ 470, 474 (CCPA 1973). ("[W]e reject the notion that judicial or administrative notice may be taken of the state of the art. The facts constituting the state of the art are normally subject to the possibility of rational disagreement among reasonable men, and are not amenable to the taking of such notice.").

It is never appropriate to rely solely on "common knowledge" in the art without evidentiary support in the record, as the principal evidence upon which a rejection was based. Zurko, 258 F.3d at 1385, 59 USPQ2d at 1697 ("[T]he Board cannot simply reach conclusions based on its own understanding or experience, or on its assessment, of what would be basic knowledge or common sense. Rather, the Board must point to some concrete evidence in the record in support of these findings."). While the court explained that, "as an administrative tribunal the Board clearly has expertise in the subject matter over which it exercises jurisdiction," it made clear that such "expertise may provide sufficient support for conclusions [only] as to peripheral issues." Id. at 1385-86, 59 USPQ2d at 1697. As the court held in Zurko, an assessment of basic knowledge and common sense that is not based on any evidence in the record lacks substantial evidence support. Id. at 1385, 59 USPQ2d at 1697. See also In re Lee, 277 F.3d 1338, 1344-45, 61 USPQ2d 1430, 1434-35 (Fed. Cir. 2002). (In reversing the Board's decision, the court stated " 'common knowledge and common sense' on which the Board relied in rejecting Lee's application are not the specialized knowledge and expertise contemplated by the Administrative Procedure Act. Conclusory statements such as those here provided do not fulfill the agency's obligation. The board cannot rely on conclusory statements when dealing with particular combinations of prior art and specific claims, but must set forth the rationale on which it relies.").

Ordinarily, there must be some form of evidence in the record to support an assertion of common knowledge. See Lee, 277 F.3d at 1344-45, 61 USPQ2d at 1434-35 (Fed. Cir. 2002); Zurko, 258 F.3d at 1386, 59 USPQ2d at 1697 (holding that general conclusions concerning what is "basic knowledge" or "common sense"

to one of ordinary skill in the art without specific factual findings and some concrete evidence in the record to support these findings will not support an obviousness rejection). In certain older cases, official notice has been taken of a fact that is asserted to be "common knowledge" without specific reliance on documentary evidence where the fact noticed was readily verifiable, such as when other references of record supported the noticed fact, or where there was nothing of record to contradict it. See In re Soli, 317 F.2d 941, 945-46, 137 USPQ 797, 800 (CCPA 1963) (accepting the examiner's assertion that the use of "a control is standard procedure throughout the entire field of bacteriology" because it was readily verifiable and disclosed in references of record not cited by the Office); In re Chevenard, 139 F.2d 711, 713, 60 USPQ 239, 241 (CCPA 1943) (accepting the examiner's finding that a brief heating at a higher temperature was the equivalent of a longer heating at a lower temperature where there was nothing in the record to indicate the contrary and where the applicant never demanded that the examiner produce evidence to support his statement). If such notice is taken, the basis for such reasoning must be set forth explicitly. The examiner must provide specific factual findings predicated on sound technical and scientific reasoning to support his or her conclusion of common knowledge. See Soli, 317 F.2d at 946, 37 USPQ at 801; Chevenard, 139 F.2d at 713, 60 USPQ at 241. The applicant should be presented with the explicit basis on which the examiner regards the matter as subject to official notice and be allowed to challenge the assertion in the next reply after the Office action in which the common knowledge statement was made. Thus, the Examiner has failed to provide the Applicant any evidence that the prior art or the Examiner's knowledge regarding his conclusions, even though the same traversal was made on two occasions (response to office action date 7-28-03 and response to final office action dated 12-22-03). The Examiner merely provided his conclusions without substantiation or corroboration. In his Advisory Action of 5-4-04, the following two line statement was provided: "Continuation of 5. does NOT place the application in condition for allowance because: the claims do not define over the art of record. Applicant's arguments have been fully considered but they are not persuasive."

A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984) (Claims were directed to a process of producing a porous article by expanding shaped, unsintered, highly crystalline poly(tetrafluoroethylene) (PTFE) by stretching said PTFE at a 10% per second rate to more than five times the original length. The prior art teachings with regard to unsintered PTFE indicated the material does not respond to conventional plastics processing, and the material should be stretched slowly. A reference teaching rapid stretching of conventional plastic polypropylene with reduced crystallinity combined with a reference teaching stretching unsintered PTFE would not suggest rapid stretching of highly crystalline PTFE, in light of the disclosures in the art that teach away from the invention, i.e., that the conventional polypropylene should have reduced crystallinity before stretching, and that PTFE should be stretched slowly.) Thus, it is an impermissible jump to indicate what is well known in the art to apparently hold that Sharp discloses the polarization rotating element(s) added to the outside of a polarized display panel even though the Applicant argued and substantiated its argument with an affidavit of an expert in the art, that Sharp teaches that the polarization rotating element(s) are inside of the polarized display panel which includes the polarizers. One skilled in the art would recognize that the difference (inside or outside the polarizer) is significant, and that this is not just a rearrangement of elements having no impact on operation. Further, Sharp does not discuss or suggest placing a polarizing film between the polarization rotating element(s) and the variable retarder, and in fact teaches away from this feature as this configuration would eliminate the functionality which is the basis for Sharp's invention. Thus, the claims are allowable.

The applicant pointed these two issues out to the Examiner in the two responses (response of May 8, 2003 and the response to the final office action and the attached affidavit of Brent Larson, Ph.D. of December 22, 2003). The applicant

specifically challenged the evidentiary support such as prior art to support the Examiner's conclusion. The affidavit of Brent Larson, PhD., an expert in the art, refuted the Examiner's statements. Despite this challenge, the Examiner failed to provide any support in the advisory action and merely referred back to his final office action. He indicated that the combination of the references teaches the claimed invention, which has been discussed above and continued with his "apparent well known in the art rejection" without further evidentiary support. To adequately traverse such a finding, an applicant must specifically point out the supposed errors in the examiner's action, which would include stating why the noticed fact is not considered to be common knowledge or well-known in the art. See 37 CFR 1.111(b). See also Chevenard, 139 F.2d at 713, 60 USPQ at 241 ("[I]n the absence of any demand by appellant for the examiner to produce authority for his statement, we will not consider this contention.") A general allegation that the claims define a patentable invention without any reference to the examiner's assertion of official notice would be inadequate. If applicant adequately traverses the examiner's assertion of official notice, the examiner must provide documentary evidence in the next office action if the rejection is to be maintained. See 37 CFR 1.104(c)(2). See also Zurko, 258 F.3d at 1386, 59 USPQ2d at 1697 ("[T]he Board [or examiner] must point to some concrete evidence in the record in support of these findings" to satisfy the substantial evidence test). If the examiner is relying on personal knowledge to support the finding of what is known in the art, the examiner must provide an affidavit or declaration setting forth specific factual statements and explanation to support the finding. See 37 CFR 1.104(d)(2).

If applicant does not traverse the examiner's assertion of official notice or applicant's traverse is not adequate, the examiner should clearly indicate in the next office action that the common knowledge or well-known in the art statement is taken to be admitted prior art because applicant either failed to traverse the examiner's assertion of official notice or that the traverse was inadequate. If the traverse was inadequate, the examiner should include an explanation as to why it was inadequate. There was no explanation or evidence to support the conclusions from

the Examiner nor was there any discussion from the Examiner that the Applicant's traversal was inadequate. Thus it is clear that the rejected claims under this section are allowable.

B. 35 U.S.C. § 103(a): Sharp, et al. (US Patent No. 5,999,240) reference and Larson (5,751,388) reference.

Claim 4 was rejected under 35 USC § 103(a) as being unpatentable over Sharp, et al. (US Patent No. 5,999,240). Claim 4 is a dependent claim and due to the allowablity of independent claim 1, this claim is also allowable. If an independent claim is non-obvious under 35 U.S.C. 103, then any claim depending therefrom is non-obvious. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Claims 9, 11, 17-18 were rejected under 35 USC § 103 (a) as being unpatentable over Sharp, et al. ('240), in view of Larson ('388). The apparatus of claim 17, supported by Fig. 2 and page 11, lines 22-23, page 12 lines 4-5, page 9 lines 22-24, and page 13, line 21 through page 14 line 2, comprises a transmissive polarization rotating element attached to an exterior surface of a polarization sensitive scattering element and improves the viewability characteristics of a polarized display panel. As has been extensively discussed in the previous section as well as previous responses to the Examiner, Sharp, et al. ('240) teaches away from placing the polarization rotating elements on the outside of a polarized display panel. Larson ('388) teaches the placement of a polarization sensitive scattering element outside a polarized display panel. See for example FIG. 1 of Larson ('388), clearly showing PSSE 17 located external to the polarized display panel formed by 16, 10 and 15. Attaching the (internal) transmissive polarization rotating element of Sharp to an external surface of the (external) polarization sensitive scattering element of Larson is nonsensical, as this would require the polarization rotating element to be both inside and outside of the polarized display panel (i.e., both on the left and the right sides of rear polarizer 16 in FIG.1 of Larson ('388)). The Examiner did not address the arguments or reasoning advanced to him for this

novel feature. He merely continued his unsubstantiated rejections. Thus, the Examiner has failed to provide the Applicant any evidence that the prior art or the Examiner's knowledge that "the polarization rotating element being attached to an exterior surface" is not novel, even though the applicant traversed the rejection on two occasions (response to office action date 7-28-03 on page 9 and response to final office action dated 12-22-03, page 9). Included in the responses were detailed arguments as to the absence in the prior art of the novel feature and the last response contained an affidavit supporting the position of the applicant. The Examiner merely provided his repeated conclusions without substantiation or corroboration. Thus, the same legal argument as set forth above in the prior section (Section A) is applicable and incorporated herein as if fully set forth.

Contrary to the examiner's repeated assertions, the combination of these references clearly does not teach or suggest the present invention, and hence claim 17 is allowable. Claims 9, 11, and 18 are dependent claims and due to the allowability of the independent claim, they are also allowable.

Conclusion

The prior art cited by the Examiner fails to disclose or imply the novel features of the claims in the present patent application. The Examiner failed to provide any prior art or evidence of common knowledge of the feature as claimed by the Applicant, thus all of the pending claims are allowable.

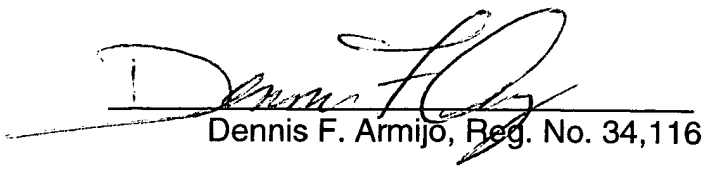
(9) Appendix A

As previously indicated, an Appendix containing a copy of the claims involved in this appeal is attached as Appendix A.

(10) Appendix B

An appendix containing a copy of the cases cited in this appeal is attached as Appendix B.

Respectfully submitted,



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APPENDIX A
to Appeal Brief of Appellant

CLAIMS

CLAIMS

1. (Previously Amended) A polarized display device having an expanded angle of illumination for optimizing a viewing angle in a desired plane comprising:

a direct view polarized display panel; and

a transmissive polarization rotating element proximate to an exterior surface of the polarized display panel, wherein said transmissive polarization rotating element rotates light polarization between a first linear polarization orientation and a second linear polarization orientation

2. (Previously Amended) The polarized display device of claim 1 wherein said first linear polarization orientation comprises an incoming orientation and said second linear polarization orientation comprises an outgoing orientation.

3. (Original) The polarized display device of claim 2 wherein said incoming orientation comprises a rear element pass axis and said outgoing orientation comprises a rear polarizer pass axis.

4. (Previously Amended) The polarized display device of claim 1 wherein said transmissive polarization rotating element is index matched to the direct view polarized display panel.

5. (Previously Amended) The polarized display device of claim 1 wherein the first linear polarization orientation is aligned with a major axis of a desired viewing envelope.

6. (Previously Amended) The polarized display device of claim 1 wherein said transmissive polarization rotating element is located in front of the direct view polarized display panel.

7. (Previously Amended) The polarized display device of claim 1 wherein said transmissive polarization rotating element is located to a rear of the direct view polarized display panel.

8. (Previously Amended) The polarized display device of claim 1 further comprising an optical element adjacent to a first side of said transmissive polarization rotating element and the direct view polarized display panel adjacent to a second side of said polarization rotating element.

9. (Original) The polarized display device of claim 8 wherein the optical element has polarization-sensitive asymmetric transmittance characteristics related to Brewster angle effects.

10. (Original) The polarized display device of claim 8 wherein the optical element has a polarization axis.

11. (Original) The polarized display device of claim 10 wherein the optical element comprises a polarization sensitive scattering element.

12. (Previously Amended) The polarized display device of claim 1 wherein the transmissive polarization rotating element comprises a member from the group consisting of a retarder, a halfwave retarder, a multilayer retarder and a twisted optical axis element.

13. (Previously Amended) The polarized display device of claim 1 wherein the viewing angle comprises an angle of more than 20 degrees off of normal.

14. (Canceled)

15. (Previously Amended) The polarized display device of claim 1 wherein the direct view polarized display panel is an active matrix liquid crystal display.

16. (Original) The polarized display device of claim 8 wherein the optical element is an optical film.

17. (Previously Amended) An apparatus for improving the viewability characteristics of a polarized display panel comprising:

a polarization sensitive scattering element having a polarization axis; and

a transmissive polarization rotating element attached to an exterior surface of the polarization sensitive scattering element, wherein said transmissive polarization rotating element rotates light polarization between a first linear polarization orientation and a second linear polarization orientation.

18. (Previously Amended) The invention of claim 17 wherein said polarization axis of said polarization sensitive scattering element is oriented such that a major axis of a transmittance envelope associated with said polarization sensitive scattering element is oriented along a desired viewing angle.

19. (Previously Amended) A method of projecting light using a polarized display, the method comprising the steps of:

transmitting light from a rear optical element in an asymmetric angular pattern for a first linear polarization and having a transmittance envelope with a major axis for the first linear polarization;

receiving light by a transmissive polarization rotating element from said rear optical element in the first linear polarization;

rotating light to a second linear polarization by the transmissive polarization rotating element; and

receiving light from the transmissive polarization rotating element in the second linear polarization by a polarized display panel having a rear polarizer.

20. (Original) The method of claim 19 further comprising the step of selecting a range of angles to be optimized.

21. (Previously Amended) The method of claim 20 wherein the step of selecting a range of angles comprises selecting a material for the transmissive polarization rotating element that corresponds with the selected angle.

22. (Original) The method of claim 21 wherein the step of selecting a material comprises selecting a material with predetermined retardances and angles.

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23. (Previously Amended) A polarized display device comprising:

a rear optical element transmitting light in a pattern and having a first linear polarization;

a direct view polarized display panel having a rear polarizer oriented to receive light from the rear optical element in the first linear polarization and transmit light in a second linear polarization; and

a transmissive polarization rotating element affixed to an exterior surface of the direct view polarized display panel receiving light from the direct view polarized display panel in the second linear polarization, rotating the light to a third linear polarization, and transmitting the light.

24. (Original) The polarized display device of claim 23 wherein the pattern of light transmitted by the rear optical element has a major axis and a minor axis, the major axis being aligned with the pass axis of the polarized display panel and being significantly broader than the minor axis.

APPENDIX B
to Appeal Brief of Appellant

CASES

1. AHLERT, 424 F.2d 1088, 1091, 1092,165 USPQ 418, 420-21 (CCPA 1970).
2. CHEVENARD, 139 F.2d 711, 713, 60 USPQ 239, 241 (CCPA 1943).
3. EVNDE et al., 480 F.2d 1364, 1370, 178 USPQ 470, 474 (CCPA 1973).
4. FINE, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).
5. FOX, 471 F.2d 1405, 1407, 176 USPQ 340, 341 (CCPA 1973).
6. W. L. GORE & ASSOCIATES, INC. v. GARLOCK, INC., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984).
7. GROSE, 592 F.2d 1161, 1167-68, 201 USPQ 57, 63 (CCPA 1979).
8. KNAPP MONARCH CO., 296 F.2d 230, 132 USPQ 6 (CCPA 1961).
9. LEE, 277 F.3d 1338, 1344-45, 61 USPQ2d 1430, 1434-35 (Fed. Cir. 2002).
10. SOLI, 317 F.2d 941, 945-46, 137 USPQ 797, 800 (CCPA 1963).
11. ZURKO, 258 F.3d 1379, 1385, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001).

57 CCPA

Application of Wilhelm AHLERT and Ernst Kruger.

Patent Appeal No. 8232.

United States Court of Customs and Patent Appeals.

April 30, 1970.

Proceeding in matter of application for patent. The Patent Office Board of Appeals, serial No. 426,838, affirmed decision of examiner rejecting all involved claims as unpatentable over prior art, and applicant appealed. The Court of Customs and Patent Appeals, Baldwin, J., held that method and apparatus claims of application for patent involving method and apparatus for heat treatment of rail welds were properly rejected on grounds of obviousness.

Affirmed.

Rich, Acting C. J., concurs in result.

1. Patents ⇐113(6)

Rule that patent office appellate tribunals, where it is found necessary, may take notice of facts beyond record which, while not generally notorious, are capable of such instant and unquestionable demonstration as to defy dispute will always be narrowly construed by Court of Custom and Patent Appeals with regard to facts found in such manner with eye toward narrowing scope of any conclusions to be drawn therefrom. Patent Office Practice Rules, rule 196(b), 35 U.S.C.A. App.

2. Patents ⇐97

Assertion of technical facts in areas of esoteric technology must always be supported by citation to some reference work recognized as standard in pertinent art and applicant must be given, in patent office, opportunity to challenge correctness of assertion or notoriety or repute of cited reference. Patent Office Practice Rules, rule 196(b), 35 U.S.C.A. App.

3. Patents ⇐97

Allegations concerning specific knowledge of prior art, which might be peculiar to particular art, should be supported and applicant should be given, in patent office, opportunity to challenge correctness of assertion or notoriety or repute of cited reference. Patent Office Practice Rules, rule 196(b), 35 U.S.C.A. App.

4. Patents ⇐113(1)

Where patent applicant has failed to challenge fact judicially noticed by patent office, and it is clear that he has been amply appraised of such finding so as to have opportunity to make challenges as to correctness of assertion or notoriety or repute of cited reference, Board's finding will be considered conclusive by Court of Custom and Patent Appeals. Patent Office Practice Rules, rule 196(b), 35 U.S.C.A. App.

5. Patents ⇐97

Procedural aspects of judicial notice respecting opportunity to challenge correctness of assertion or notoriety or repute of cited reference are designed with purpose of fully utilizing independent and specialized technical expertise of patent office examiners while balancing applicant's rights to fair notice and opportunity to be heard, and equally important is question of what role facts so found may play in evidentiary scheme upon which rejection of claims is based. Patent Office Practice Rules, rule 196(b), 35 U.S.C.A. App.

6. Patents ⇐113(6)

In considering propriety of new facts judicially noticed amounting to new ground for rejection, Court of Custom and Patent Appeals would take judicial notice that it is not uncommon for Patent Office Board of Appeals itself to cite new references, in which case new ground of rejection is always stated. Patent Office Practice Rules, rule 196(b), 35 U.S.C.A. App.

7. Patents ⇐113(6)

Regardless of whether Patent Office Board of Appeals actually invoked

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8. Patents ⇐18

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Bryan & Butrum
James E. Bryan, W
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Joseph Schimmel,
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E. Armore, Washin
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Before RICH, A
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BALDWIN, Judge

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1. Serial No. 426,838,
Treatment of Rail W

rule governing decision by Board of Appeals and providing for grounds not involved in appeal, where grounds for rejection were adequately clear and it was not evident that applicants had been denied any procedural rights accorded them by rule and applicants raised no issue as to new grounds, rejections would be treated by Court of Customs and Patent Appeals as having been made by Board of Appeals. Patent Office Practice Rules, rule 196(b), 35 U.S.C.A. App.

8. Patents ⇐18

Method and apparatus claims of application for patent involving method and apparatus for heat treatment of rail welds were properly rejected on grounds of obviousness. 35 U.S.C.A. § 103.

Bryan & Butrum, Roy W. Butrum, James E. Bryan, Washington, D. C., attorneys of record, for appellants.

Joseph Schimmel, Washington, D. C., for the Commissioner of Patents. Jack E. Armore, Washington, D. C., of counsel.

Before RICH, Acting Chief Judge, ALMOND, BALDWIN, and LANE, Judges, and RAO, Chief Judge, United States Customs Court, sitting by designation.

BALDWIN, Judge.

This appeal is from the decision of the Patent Office Board of Appeals which affirmed the rejection of all claims in appellants' application[1] as unpatentable under 35 U.S.C. § 103.

THE INVENTION

The application discloses a technique for controlling the rate of cooling of a weld between two sections of railroad rail and the apparatus for accomplishing the method "without creating any disturbance in the railroad traffic" and "independently of the prevailing weather conditions." The controlled heat treatment provided is alleged to result in a tough, crack-free weld having reduced internal stresses.

Claims 1–6 are directed to the method, claim 1 being representative:

> 1. A method for the heat treatment of a rail weld while the rail is in service which comprises directing at least one flame toward each side of the rail over at least a portion of a zone between the rail foot and the rail head only, and adjusting the intensity of the flames and the burning time thereof in accordance with the heat treatment desired.

A preferred embodiment of the apparatus designed to carry out the disclosed technique is shown in the application drawing, figure 3 of which is reproduced below for illustration:

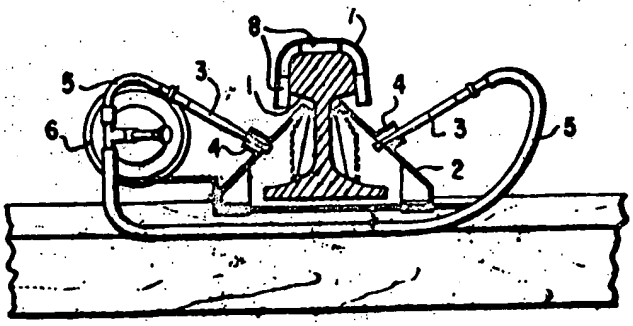

FIG. 3

[A1647]

1. Serial No. 426,838, filed January 21, 1965, entitled "Method and Apparatus for the Heat Treatment of Rail Welds."

The view is of a cross-section through the apparatus and a rail. As described by appellants [with numbering and explanation added by us for convenience], the apparatus

> includes a profile-free hood [2] which may be in two or more parts and which encloses the rail foot or base and the rail web [the central portion, between the rail foot or base and the top or head] to a point below the rail head, and which also encloses the rail over a portion of the length thereof. One or more burners [3] are mounted in the hood on each side of the rail.
>
> The apparatus advantageously includes a removable head cover or hood [7] which envelops the rail head and extends over a portion of the length thereof. * * * [W]arm air and gases rising from the heating chamber are absorbed by the hood, guided around the rail head, and laterally discharged after giving off their heat.

Claims 7–11 are the apparatus claims, the broadest of which, claim 7 states:

> 7. An apparatus for use in the heat treatment of a rail weld which comprises a hood adapted to enclose only the foot and web of a rail, and at least one burner mounted in the hood on each side of the rail.

Claim 9 provides that the hood be made in two parts, and claim 8 includes the removable cover. Claims 10 and 11 recite means for adjusting the burning time and intensity of the flames emitted by the burners.

THE REJECTION

The examiner finally rejected all of the claims as unpatentable under 35 USC 103 over a patent to Ronay.[2] This reference discloses a portable furnace, made in sections in order to fully enclose two members ("such as pipe, tubing, bars, *rails*, etc.") (Ital. ours) to be butt welded together while providing the heat necessary for welding. The heating element, or muffle, of the furnace is made of combustible material. The supply of gases to the muffle may be controlled in order to regulate the rate of combustion and, thereby, the intensity of the heat and the burning time. It was considered to be obvious "[i]n using the apparatus of Ronay" to enclose and heat only portions of the work piece. In the examiner's Answer, reference was made to a patent to Van Swaal,[3] which discloses apparatus, in a shape similar to appellant's head cover, with flame providing means attached thereto for flame treating rail heads in order to harden the rail surface. The reference was cited as an "example of heating only a portion of a rail".

The board found "no reversible error in the conclusion of the examiner that the claims are unpatentable over the references." However, in doing so, it was found necessary to elevate Van Swaal to the status of a reference fully relied upon to support the rejection and to take "judicial notice" of certain additional facts. Breaking the claimed method down into separate elements, the board first took judicial notice of the fact "that it is common practice to post-head a weld after the welding operation is completed" and held that "to apply the heat to heat treat a weld does not distinguish patentably over Ronay, who applies heat to weld the parts together" or Van Swaal, who "shows applying heat to a rail to heat treat the rail." It was further stated "that since Van Swaal shows directing the heat over a particular portion of a rail, it would be obvious to one skilled in the art to direct the flame over any desired portion of a rail." Finally, judicial notice was taken "of the fact that it is old to adjust intensity of a flame in accordance with the heat requirements."

With regard to the apparatus claims, the board relied on Van Swaal in deciding that "to enclose a particular part of a rail and to direct heat thereto is without patentable significance." Further

2. U.S. Patent 3,074,704, issued January 22, 1963.

3. U.S. Patent 2,882,191, issued April 14, 1959.

noting that the "removable cover" limitation of claim 8 was "without patentable significance" and taking judicial notice of "the fact that it is common practice to provide a weld with a cover during postheating," and incorporating "reasons pointed out in connection with claim 1," the board sustained the rejection of the claims drawn to the apparatus.

OPINION

Appellants' first argument on appeal emphasizes "[t]wo basic concepts of the present invention," the first being that the claimed invention "relates to an arrangement wherein the rails of a railway track are treated *while in service,*" the second being "that *only the zone between the rail foot and the rail head is heat treated*" (emphasis appellants'). It is urged that none of the references relied upon shows or suggests these two "fundamental features."

Appellant also contests the conclusions drawn by the Board of Appeals from the facts judicially noticed and, in addition, attacks the propriety of the board's taking such judicial notice, urging that the facts are "not so notorious and well known that any court would be justified in taking judicial notice thereof."

The solicitor counters appellants' first argument by maintaining that the first concept was, in fact, considered when it was held obvious by the examiner, albeit without specific support "to heat a rail while in service by merely enclosing a portion of the rail that has no vehicle thereon" [Sic] He alternatively asserts that, given the knowledge judicially noticed by the board,

> that "rail blankets" may be employed to provide a cover when postheating welds * * *, it would require no stretch of imagination beyond the skill of the art to permit the passage of trains thereover with damage limited only to the cover * * *

The second concept, the solicitor urges, which calls for the selective heating of only the rail web, is neither expressly disclosed nor found as a specific limitation in the claims. We are inclined to agree that appellants' arguments in this regard are not convincing of reversible error below.

[1–4] With regard to the attack on the "judicial notice" by the board we must also agree with the solicitor's assertion that there is no real dispute as to the *facts* of which the board took notice. As to the propriety of the board's taking such notice at all, this court has already previously determined that the Patent Office appellate tribunals, where it is found necessary, may take notice of facts beyond the record which, while not generally notorious, are capable of such instant and unquestionable demonstration as to defy dispute. In re Knapp Monarch Co., 296 F.2d 230, 49 CCPA 779 (1961). This rule is not, however, as broad as it first might appear, and this court will always construe it narrowly and will regard facts found in such manner with an eye toward narrowing the scope of any conclusions to be drawn therefrom. Assertions of technical facts in areas of esoteric technology must always be supported by citation to some reference work recognized as standard in the pertinent art and the appellant given, in the Patent Office, the opportunity to challenge the correctness of the assertion or the notoriety or repute of the cited reference. *Cf.* In re Cofer, 354 F.2d 664, 53 CCPA 830 (1966); In re Borst, 345 F.2d 851, 52 CCPA 1398 (1965). Allegations concerning specific "knowledge" of the prior art, which might be peculiar to a particular art should also be supported and the appellant similarly given the opportunity to make a challenge. *See* In re Spormann, 363 F.2d 444, 53 CCPA 1375 (1966). Where the appellant has failed to challenge a fact judicially noticed and it is clear that he has been amply apprised of such finding so as to have the opportunity to make such challenge, the board's finding will be considered conclusive by this court. In re Perkins, 346 F.2d 981, 52 CCPA 1501

(1965); In re Knapp Monarch Co., *supra*.

[5] These aspects of judicial notice are primarily procedural, however, designed with the purpose in mind of fully utilizing the independent and specialized technical expertise of the Patent Office examiners while balancing the applicant's rights to fair notice and an opportunity to be heard. Equally important is the question of what role the facts so found may play in the evidentiary scheme upon which a rejection of claims is based. Typically, it is found necessary to take notice of facts which may be used to supplement or clarify the teaching of a reference disclosure, perhaps to justify or explain a particular inference to be drawn from the reference teaching. The facts so noticed serve to "fill in the gaps" which might exist in the evidentiary showing made by the examiner to support a particular ground for rejection. We know of no case in which facts judicially noticed comprised the principal evidence upon which a rejection was based or were of such importance as to constitute a new ground of rejection when combined with the other evidence previously used.

[6] Looking at the facts of this case, we are constrained to hold that the manner in which the board treated the claims, combining the disclosures of the references with the new facts judicially noticed, amounted to a new ground of rejection. We consider the use of the Welding Handbook and the facts taken from it to have been in clear contravention of both the letter and the spirit of Patent Office Rule 196.[4] Calling the facts "judicially noticed" does not change their effect.

[7] Nevertheless, regardless of whether the board actually invoked the rule or not, or that the rejection is stated in somewhat archaic language, the grounds for rejection are adequately clear. It is also not evident that appellants have been denied any of the procedural rights accorded them by Rule 196(b). Compare In re Hughes, 345 F. 2d 184, 52 CCPA 1355 (1965). Therefore, since appellants have raised no issue as to this point, we will treat the rejections as we consider them to have been made by the board. In re Miller, 329 F.2d 1015, 51 CCPA 1135 (1964).

[8] As far as the method claims are concerned, we are satisfied that the board's rejection is sustainable. Considering the recited method in its entirety, we find no reason to disagree with the conclusion that what is claimed would be obvious in view of the prior art of record including the Handbook pages cited by the board. While it does not immediately follow that because the *method* is obvious, a particular *means* for carrying out that method is also obvious, we must conclude that, in this case, the same reasoning and references

4. The pertinent part of Rule 196 is section (b) which reads:

> (b) Should the Board of Appeals have knowledge of any grounds not involved in the appeal for rejecting any appealed claim, it may include in its decision a statement to that effect with its reasons for so holding, which statement shall constitute a rejection of the claims. The appellant may submit an appropriate amendment of the claims so rejected or a showing of facts, or both, and have the matter reconsidered by the primary examiner. The statement shall be binding upon the primary examiner unless an amendment or showing of facts not previously of record be made which, in the opinion of the primary examiner, avoids the additional ground for rejection stated in the decision. The applicant may waive such reconsideration before the primary examiner and have the case reconsidered by the Board of Appeals upon the same record before them. Where request for such reconsideration is made the Board of Appeals shall, if necessary, render a new decision which shall include all grounds upon which a patent is refused. The applicant may waive reconsideration by the Board of Appeals and treat the decision, including the added grounds for rejection given by the Board of Appeals, as a final decision in the case.

We here take judicial notice that it is not uncommon for the board itself to cite new references, in which case a new ground of rejection is always stated.

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which were employed to show the method to be obvious were also properly used to reject the apparatus claims. The decision of the Board of Appeals is affirmed.

Affirmed.

RICH, Acting C. J., concurs in the result.

57 CCPA

The FRANCESCO PARISI FWDG. CORP., Appellant,

v.

The UNITED STATES, Appellee.

Customs Appeal No. 5354.

United States Court of Customs and Patent Appeals.

May 7, 1970.

Proceeding on protest against classification of stereocomparator as "surveying instrument". The Customs Court, 296 F.Supp. 315, overruled the protest, and importer appealed. The Court of Customs and Patent Appeals, Lane, J., held that evidence was insufficient to establish that surveying was not chief use of device, although evidence established several possible nonsurveying uses.

Affirmed.

1. Customs Duties ⇐52

Party protesting classification of device as surveying instrument had burden of proving that surveying was not its chief use.

2. Customs Duties ⇐52

Evidence in proceeding on protest against classification of stereocomparator as "surveying instrument" was insufficient to establish that surveying was not chief use of device, although evidence established several possible nonsurveying uses. Tariff Act of 1930, § 1, pars. 353, 360, 46 Stat. 618, 620.

3. Customs Duties ⇐52

Party protesting customs classification has burden to rebut presumption attaching to classification.

4. Customs Duties ⇐26(2)

"Surveying instruments", in Tariff Act, would not be limited to devices used in field for surveying purposes in absence of evidence of meaning of term in trade. Tariff Act of 1930, § 1, pars. 353, 360, 45 Stat. 618, 620.

See publication Words and Phrases for other judicial constructions and definitions.

Allerton deC. Tompkins, New York City, attorney of record, for appellant.

William D. Ruckelshaus, Asst. Atty. Gen., Andrew P. Vance, Chief, Customs Section, Gilbert Lee Sandler, Customs Section, New York City, for the United States.

Before RICH, Acting Chief Judge, BALDWIN and LANE, Judges, and JONES, Senior Judge, United States Court of Claims, sitting by designation.

LANE, Judge.

The importer appeals from the decision and judgment of the Customs Court, 62 Cust.Ct. 207, C.D. 3730 (1969), overruling its protest against the classification of a device invoiced as a Nistri Stereocomparator.

The stereocomparator weighs slightly over 4,000 pounds and is roughly 6 feet long, 3 feet deep and 4 feet high. It possesses three stages on which flat and preferably translucent objects may be placed. An optical system is provided for viewing any two of the stages at the same time and for photographing such views. The stages are movable through precisely defined distances by means of hand wheels which control electric motors. The motors rotate lead screws which translate the stages. The distances moved are registered on a display panel. The planar Cartesian co-

[2] Apparently the board thought that the election stated by the examiner resulted in the dividing out of claims 15 and 16. The Board of Appeals generally affirmed the decision of the examiner with respect to those claims. No question on the board's ruling in this respect has been discussed by the appellant. There is nothing in the record or appellant's brief upon which consideration of the board's holding may be made.

For the reasons herein set out, the decision of the Board of Appeals is affirmed.

Affirmed.

In re CHEVENARD.

Patent Appeal No. 4804.

Court of Customs and Patent Appeals.

Dec. 8, 1943.

1. Patents ⇐113(1)

Where applicant for patent for process for making compensating watch springs did not contradict holding of primary examiner with respect to a brief heating at 550 degrees to 750 degrees C. as the equivalent of a longer heating at a lower temperature, and made no demand for examiner to produce authority for his statement, Court of Customs and Patent Appeals would not consider contention that examiner's statement did not coincide with actual facts.

2. Patents ⇐66(1)

Claims 8 and 10 of application for a patent for process for making compensating watch springs *held* properly rejected as not patentable over cited prior art.

3. Patents ⇐113(8)

Where claims of application for patent which were rejected on ground of estoppel were for species other than claim elected to be prosecuted in absence of a generic claim, upon the generic claim being held not patentable over cited prior art, it was necessary to affirm decision in so far as it rejected the claims on ground of estoppel.

Appeal from the Board of Patent Appeals, Serial No. 208,487.

Proceeding in the matter of the application of Pierre Chevenard for a patent. From a decision of the Board of Appeals of the United States Patent Office affirming the final rejection by the primary examiner of all of the claims, the applicant appeals.

Affirmed.

E. F. Wenderoth, of Washington, D. C. (A. Ponack, of Washington, D. C., of counsel), for appellant.

W. W. Cochran, of Washington, D. C. (R. F. Whitehead, of Washington, D. C., of counsel), for Commissioner of Patents.

Before GARRETT, Presiding Judge, and BLAND, HATFIELD, LENROOT, and JACKSON, Associate Judges.

JACKSON, Associate Judge.

This is an appeal from a decision of the Board of Appeals of the United States Patent Office affirming the final rejection by the Primary Examiner of all of the claims, 8, 10, 12 and 13, of an application for a patent alleging "Improvements in the Manufacture of Compensating Spiral Springs for Watches, Chronometers and the Like." This is a companion appeal to In re Chevenard, Cust. & Pat.App. 139 F.2d 709.

Claims 8 and 10 are illustrative of the subject matter involved, and read as follows:

"8. A process for the manufacture of compensating spiral springs for watches, chronometers and the like, which comprises the steps of taking an austenitic iron-nickel alloy, containing 28–42% of nickel, 0.3–1% of carbon, 4–8% of chromium, 0.5–2% of manganese, 0.2–1% of silicon and additionally a small proportion of at least one of the elements taken from a group consisting of tungsten, molybdenum, vanadium, titanium, aliminium, copper and cobalt for entering into solid solution in the austenite so as to modify its thermoelastic anomaly, and at the same time forming complex carbides which are more soluble hot than cold in the austenite, subjecting it to a gradual wire drawing, with reheatings between the passes, down to a diameter from about 0.4 to about 1 mm, subjecting the wire to a hyperquenching, continuing wire drawing without intermediary reheating, rolling the wire into a ribbon of the desired transverse section, winding the ribbon into a spiral form and finally fixing the latter by heating to temperatures of 550 to 750° C."

"10. A process as set forth in claim 8 in which an alloy is taken comprising 28–42% Ni, 4–8% Cr, 0.5–4% W, 0.5–2% Mn, 0.2–1% Si, 0.3–1% C and at least two of the element Mo, Va, Ti and Al in a total amounting to at least 0.5% and at most 4%, as well as Fe to make up 100."

The reference cited is an article by M. A. Hunter entitled "Alloys of Iron and Nickel with Low Expansion Coefficients", Metals Handbook, 1936 Ed., American Society for Metals, Cleveland, pp. 345 to 349.

The alleged invention relates to a process for making compensating watch springs. The alloy, a type of iron-nickel, is stated to be of the so-called "Elinvar" modification of the "Invar" type. The content of the wire spring and its treatment are so clearly set out in the claims that it is not deemed necessary to describe them further.

While claims 10, 12, and 13 claim the same process as set forth in claim 8, the elements of the alloy appear to be more specific.

The examiner rejected claims 8 and 10 as lacking invention over the Hunter reference and also as failing to properly point out the alleged invention. He rejected claims 12 and 13 on the ground of estoppel in view of appellant's election in response to an Office requirement.

The Board of Appeals affirmed the decision of the examiner, holding that claims 8 and 10 lack invention over the reference, but further holding that the claims properly pointed out the alleged invention. The board affirmed the examiner's decision rejecting claims 12 and 13 on the ground of estoppel in view of applicant's said election.

The reference discloses that Invar is an alloy comprising 36% nickel with minor constituents of manganese, silicon and carbon, and that its coefficient of expansion is so low that its length is practically invariable for ordinary changes in temperature. For this reason the alloy was named Invar.

Elinvar appears to differ from Invar in that it contains a chromium content and in that it possesses the additional property of having the same elasticity "over a considerable range in temperature as well as low thermal expansivity."

The writer of the reference had the following to say concerning Elinvar:

"Elinvar—In determining the thermoelastic coefficients of nickel-iron alloys, Guillaume found that Invar had the highest elastic coefficient of all the alloys in the related group. There were, however, 2 alloys at 29% and 45% Ni which had zero coefficient, that is, their modulus of elasticity did not change with variations in temperature. But since, in these alloys, small variations in the nickel content produced large variations in the elastic coefficient, the commercial application of the discovery was a difficult one. He found that the addition of 12% chromium to an alloy containing 36% nickel produced an alloy which had zero thermoelastic coefficient and one which was not susceptible to small variations in Ni content, which are to be expected in commercial melting. To this alloy he gave the name 'Elinvar.'

"It has a particular application in the construction of such articles as hair springs and balance wheels in clocks and watches and in tuning forks used in radio synchronization, where an invariable modulus of elasticity is required. It has the further advantage in such situations of being nonmagnetic and comparatively rustproof.

"The composition of this material has been somewhat modified from the original specifications. Shubrooks gives the following limits for the material as now used.

Nickel	33–35%
Iron	61–53%
Chromium	1– 3%
Tungsten	1– 3%
Manganese	0.5–2%
Silicon	0.5–2%
Carbon	0.5–2%"

It will be noted that the elements of Elinvar disclosed in the reference are identical with those disclosed in the claims. All of the proportions of the elements shown in the reference are within the range of the elements disclosed in the claims, with the exception of chromium. We are of opinion that in view of the wide difference in amounts of chromium set out in the reference (1 to 12%), the amount of that element in the rejected claims is not critical, and there is nothing in the record from which the amount of chromium claimed could be considered as critical.

Appellant in his brief seems to concede that there is no invention in adopting the particular components of the alloys set out in the claims. He states that

"From the standpoint that the essence of the invention resides primarily in the pro-

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* * * * * *

"Coming now to the real essence of the invention, namely, the method of manipulating the alloy, the reference is submitted to be wholly lacking."

With respect to the manipulation of the alloy set out in claims 8 and 10, the examiner held that the drawing of the material with heating between the passes was merely standard hot mill routine followed in the manufacture of steel wire, whether or not it was nickel steel as here. The examiner stated that this step of drawing and heating between the passes was tacitly admitted by appellant as being standard practice.

With respect to the hyperquenching of the material and drawing without reheating, rolling to ribbon, winding to spiral form and heating to temperatures of 550° to 750° C., the examiner considered those steps to be obvious in view of the reference, calling attention to the following passage on page 347 thereof, with his comments thereon in parenthesis at the end of the quotation: "It is possible by cold work following a quenching operation to produce material with a zero coefficient of expansion or even a negative one. In the latter case by careful annealing at a low temperature, the coefficient may be increased to zero again." (The last mentioned step, which is similar in such respect to age hardening or stress relieving anneals commonly practiced after cold working, as is well known in the art of metal working, is a function of time, wherefore a brief heating at 550° to 750° C. would be the equivalent of a longer heating at a lower temperature.)

Appellant in his brief endeavors to distinguish between quenching in water as mentioned in the publication and "hyperquenching" as set out in the claims. There is nothing in this record to indicate that quenching the alloy in water is not as thorough and drastic a quenching as any which the appellant would use with his alloy.

[1] The appellant in his brief states that the examiner cited nothing to support his holding with respect to the brief heating at 550° to 750° C., as the equivalent of a longer heating at a lower temperature, and insists that the examiner's assertions do not coincide with the actual facts. In the absence of anything in the record to contradict the examiner's holding, and in the absence of any demand by appellant for the examiner to produce authority for his statement, we will not consider this contention. In re Gunther, 125 F.2d 1020, 29 C.C.P.A., Patents, 888.

[2, 3] Since we hold that claim 8, the generic claim, is not patentable over the cited prior art, it is necessary that we affirm the decision of the board in rejecting claims 12 and 13 on the ground of estoppel since those claims were for species other than the claim elected to be prosecuted in the absence of a generic claim.

For the reasons herein set forth, the decision of the Board of Appeals is affirmed.

Affirmed.

31 C.C.P.A. (Patents)

WALGREEN v. GREENWALD HOSIERY CO., Inc.

Patent Appeal No. 4772.

Court of Customs and Patent Appeals.

Dec. 8, 1943.

1. Trade-marks and trade-names and unfair competition ⇐44

The provision of Trade-Mark Registration Act that no mark which consists merely in name of individual shall be registered does not inhibit consideration of pertinent elements other than spelling, such as similarity in pronunciation and appearance, in determining whether a name sought to be registered is that of individual opposing registration. Trade-Mark Act of 1905, § 5, 15 U.S.C.A. § 85.

2. Trade-marks and trade-names and unfair competition ⇐43

The name "Waldgreen," sought to be registered as a trade-mark, being practically identical in appearance and sound to individual opposer's name, "Walgreen," is merely such opposer's name, and hence cannot be registered. Trade-mark Act of 1905, § 5, 15 U.S.C.A. § 85.

nell "assumed the risk of unavailable milling time", and that Connell's contract obligations were not conditioned thereon.

[3] Both the board, and the government in its brief, offer theories as to how Connell might have managed, at whatever cost, to obtain milled rice for timely delivery. These theories, in view of the USDA regulations, are relevant only to the question of whether Connell's failure to perform was "beyond [its] control and without [its] fault or negligence". If the government created the situation that caused or contributed to Connell's late delivery, it can not be held as a matter of law that Connell was required to exceed reasonable efforts in order to compensate for this unwarranted government action.

The government cites *Jennie-O Foods, Inc., v. United States*, 580 F.2d 400, 409–10 (Ct.Cl.1978), which held that "unanticipated economic hardship" did not excuse failure to perform where the contractor had not shown that "the product (healthy turkeys) was unavailable within the boundaries of a reasonable area." There was no issue in *Jennie-O* of governmental contribution to the failure to perform; nor was a theory of strict liability applied. The issues there raised, as here, are fact-dependent, and in *Jennie-O* were fully developed at trial.

[4] Connell must be enabled to develop the facts pertinent to its defense that the government, acting in its sovereign or contractual capacities, contributed to the delay; the extent of that contribution; and whether Connell was at fault or negligent; for these facts are material to the issues of liability, and the extent thereof. The determination must be made as to whether exculpation has been shown under the circumstances. Public policy and the national interest, as well as the principles of contract law, so require. As the Court explained in *United States v. Brooks-Callaway Co.*, 318 U.S. 120, 122, 63 S.Ct. 474, 476, 87 L.Ed. 653 (1943), the purpose of the standard proviso in government contracts that authorizes such relief is:

> Thus contractors know they are not to be penalized for unexpected impediments to prompt performance, and, since their bids can be based on foreseeable and probable, rather than possible hindrances, the Government secures the benefit of lower bids and an enlarged selection of bidders.

Although the government argues that Connell "failed to meet its burden" on summary judgment, the denial of discovery related to this defense contributed to this failure.

REVERSED AND REMANDED.

In re David H. FINE

No. 87-1319.

United States Court of Appeals, Federal Circuit.

Jan. 26, 1988.

The Board of Patent Appeals and Interferences of the United States Patent and Trademark Office affirmed rejection of claims of application for patent for system for detecting and measuring minute quantities of nitrogen compounds, and applicant appealed. The Court of Appeals, Mayer, Circuit Judge, held that: (1) it would not have been obvious to substitute nitric oxide detector for sulfur dioxide detector in prior system, and (2) sulfur detection system did not teach use of claimed temperature range.

Reversed.

Edward S. Smith, Circuit Judge, dissented and filed opinion.

1. Patents ⇐16.33

System for detecting and measuring minute quantities of nitrogen compounds was not obvious in light of prior art for separating, identifying, and monitoring sulfur compounds or method for measuring chemiluminescence of reaction between ni-

tric oxide and ozone which required continuous flowing of gaseous mixture into reaction chamber; method for measuring sulfur deliberately sought to avoid nitrogen compounds, and claimed invention retained each nitrogen compound constituent of gaseous sample in chromatograph for individual time period. 35 U.S.C.A. § 103.

2. Patents ⇐114.19, 114.21

Patent and Trademark Office has burden to establish prima facie case of obviousness, which it may satisfy only by showing some objective teaching in prior art, or that knowledge generally available to one of ordinary skill and art would lead that individual to combined relevant teachings of references. 35 U.S.C.A. § 103.

3. Patents ⇐26(1)

Whether particular combination might be "obvious to try" is not legitimate test of patentability. 35 U.S.C.A. § 103.

4. Patents ⇐16.5

Patent which described preferred temperature range for separating, identifying and quantitatively monitoring sulfur compounds could be distinguished from claimed method for detecting and measuring minute quantities of nitrogen compounds which limited temperature to prevent nitrogen from other sources, where purpose of temperature limitation in prior art was to avoid formation of unwanted sulfides.

Morris Relson, Darby & Darby, P.C., New York City, for appellant. With him on the brief was Beverly B. Goodwin.

Lee E. Barrett, Associate Sol., Office of the Solicitor, Arlington, Va., for appellee. With him on the brief were Joseph F. Nakamura, Sol. and Fred E. McKelvey, Deputy Sol.

Before FRIEDMAN, SMITH and MAYER, Circuit Judges.

OPINION

MAYER, Circuit Judge.

David H. Fine appeals from a decision of the Board of Patent Appeals and Interferences of the United States Patent and Trademark Office (Board) affirming the rejection of certain claims of his application, Serial No. 512,374, and concluding that his invention would have been obvious to one of ordinary skill in the art and was therefore unpatentable under 35 U.S.C. § 103. We reverse.

BACKGROUND

A. The Invention.

The invention claimed is a system for detecting and measuring minute quantities of nitrogen compounds. According to Fine, the system has the ability to detect the presence of nitrogen compounds in quantities as minute as one part in one billion, and is an effective means to detect drugs and explosives, which emanate nitrogen compound vapors even when they are concealed in luggage and closed containers.

The claimed invention has three major components: (1) a gas chromatograph which separates a gaseous sample into its constituent parts; (2) a converter which converts the nitrogen compound effluent output of the chromatograph into nitric oxide in a hot, oxygen-rich environment; and (3) a detector for measuring the level of nitric oxide. The claimed invention's sensitivity is achieved by combining nitric oxide with ozone to produce nitrogen dioxide which concurrently causes a detectable luminescence. The luminescence, which is measured by a visual detector, shows the level of nitric oxide which in turn is a measure of nitrogen compounds found in the sample.

The appealed claims were rejected by the Patent and Trademark Office (PTO) under 35 U.S.C. § 103. Claims 60, 63, 77 and 80 were rejected as unpatentable over Eads, Patent No. 3,650,696 (Eads) in view of Warnick, et al., Patent No. 3,746,513 (Warnick). Claims 62, 68, 69, 79, 85 and 86 were rejected as unpatentable over Eads and Warnick in view of Glass, et al., Patent No. 3,207,585 (Glass).

B. The Prior Art.

1. *Eads Patent.*

Eads discloses a method for separating, identifying and quantitatively monitoring

sulfur compounds. The Eads system is used primarily in "air pollution control work in the scientific characterization of odors from sulfur compounds."

The problem addressed by Eads is the tendency of sulfur compounds "to adhere to or react with the surface materials of the sampling and analytical equipment, and/or react with the liquid or gaseous materials in the equipment." Because of this, the accuracy of measurement is impaired. To solve the problem, the Eads system collects an air sample containing sulfur compounds in a sulfur-free methanol solution. The liquid is inserted into a gas chromatograph which separates the various sulfur compounds. The compounds are next sent through a pyrolysis furnace where they are oxidized to form sulfur dioxide. Finally, the sulfur dioxide passes through a measuring device called a microcoulometer which uses titration cells to calculate the concentration of sulfur compounds in the sample.

2. *Warnick Patent.*

Warnick is directed to a means for detecting the quantity of pollutants in the atmosphere. By measuring the chemiluminescence of the reaction between nitric oxide and ozone, the Warnick device can detect the concentration of nitric oxide in a sample gaseous mixture.

Warnick calls for "continuously flowing" a sample gaseous mixture and a reactant containing ozone into a reaction chamber. The chemiluminescence from the resulting reaction is transmitted through a light-transmitting element to produce continuous readouts of the total amount of nitric oxide present in the sample.

3. *Glass Patent.*

The invention disclosed in Glass is a device for "completely burning a measured amount of a substance and analyzing the combustion products." A fixed amount of a liquid petroleum sample and oxygen are supplied to a flame. The flame is then spark-ignited, causing the sample to burn. The resulting combustion products are then collected and measured, and from this measurement the hydrogen concentration in the sample is computed.

C. The Rejection.

The Examiner rejected claims 60, 63, 77 and 80 because "substitution of the [nitric oxide] detector of Warnick for the sulfur detector of Eads would be an obvious consideration if interested in nitrogen compounds, and would yield the claimed invention." He further asserted that "Eads teaches the [claimed] combination of chromatograph, combustion, and detection, in that order.... Substitution of detectors to measure any component of interest is well within the skill of the art." In rejecting claims 62, 68, 69, 79, 85 and 86, the Examiner said, "Glass et al. teach a flame conversion means followed by a detector, and substitution of the flame conversion means of Glass et al. for the furnace of Eads would be an obvious equivalent and would yield the claimed invention." The Board affirmed the Examiner's rejection.

DISCUSSION

A. Standard of Review.

Obviousness under 35 U.S.C. § 103 is " 'a legal conclusion based on factual evidence.' " *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1535, 218 USPQ 871, 876 (Fed.Cir.1983) (quoting *Stevenson v. Int'l Trade Comm'n*, 612 F.2d 546, 549, 204 USPQ 276, 279 (CCPA 1979)). Therefore, an obviousness determination is not reviewed under the clearly erroneous standard applicable to fact findings, *Raytheon Co. v. Roper Corp.*, 724 F.2d 951, 956, 220 USPQ 592, 596 (Fed.Cir.1983); it is "reviewed for correctness or error as a matter of law." *In re De Blauwe*, 736 F.2d 699, 703, 222 USPQ 191, 195 (Fed.Cir.1984).

> To reach a proper conclusion under § 103, the decisionmaker must step backward in time and into the shoes worn by [a person having ordinary skill in the art] when the invention was unknown and just before it was made. In light of *all* the evidence, the decisionmaker must then determine whether ... the claimed invention as a whole would have been

obvious at *that* time to *that* person. 35 U.S.C. § 103. The answer to that question partakes more of the nature of law than of fact, for it is an ultimate conclusion based on a foundation formed of all the probative facts.

Panduit Corp. v. Dennison Mfg. Co., 810 F.2d 1561, 1566, 1 USPQ2d 1593, 1595–96 (Fed.Cir.1987).

B. Prima Facie Obviousness.

Fine says the PTO has not established a *prima facie* case of obviousness. He contends the references applied by the Board and Examiner were improperly combined, using hindsight reconstruction, without evidence to support the combination and in the face of contrary teachings in the prior art. He argues that the appealed claims were rejected because the PTO thought it would have been "obvious to try" the claimed invention, an unacceptable basis for rejection.

[1, 2] We agree. The PTO has the burden under section 103 to establish a *prima facie* case of obviousness. *See In re Piasecki*, 745 F.2d 1468, 1471–72, 223 USPQ 785, 787–88 (Fed.Cir.1984). It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. *In re Lalu*, 747 F.2d 703, 705, 223 USPQ 1257, 1258 (Fed.Cir.1984); *see also Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 297 n. 24, 227 USPQ 657, 667 n. 24 (Fed.Cir.1985); *ACS Hosp. Sys., Inc. v. Montefiore Hosp.*, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir.1984). This it has not done. The Board points to nothing in the cited references, either alone or in combination, suggesting or teaching Fine's invention.

The primary basis for the Board's affirmance of the Examiner's rejection was that it would have been obvious to substitute the Warnick nitric oxide detector for the Eads sulfur dioxide detector in the Eads system. The Board reiterated the Examiner's bald assertion that "substitution of one type of detector for another in the system of Eads would have been within the skill of the art," but neither of them offered any support for or explanation of this conclusion.

Eads is limited to the analysis of sulfur compounds. The particular problem addressed there is the difficulty of obtaining precise measurements of sulfur compounds because of the tendency of sulfur dioxide to adhere to or react with the sampling analytic equipment or the liquid or gaseous materials in the equipment. It solves this problem by suggesting that the gaseous sample containing sulfur compounds be absorbed into sulfur-free methanol and then inserted into a gas chromatograph to separate the sulfur compounds.

There is no suggestion in Eads, which focuses on the unique difficulties inherent in the measurement of sulfur, to use that arrangement to detect nitrogen compounds. In fact, Eads says that the presence of nitrogen is undesirable because the concentration of the titration cell components in the sulfur detector is adversely affected by substantial amounts of nitrogen compounds in the sample. So, instead of suggesting that the system be used to detect nitrogen compounds, Eads deliberately seeks to avoid them; it warns against rather than teaches Fine's invention. *See W.L. Gore & Assoc. v. Garlock, Inc.*, 721 F.2d 1540, 1550, 220 USPQ 303, 311 (Fed.Cir. 1983) (error to find obviousness where references "diverge from and teach away from the invention at hand"). In the face of this, one skilled in the art would not be expected to combine a nitrogen-related detector with the Eads system. Accordingly, there is no suggestion to combine Eads and Warnick.

Likewise, the teachings of Warnick are inconsistent with the claimed invention, to some extent. The Warnick claims are directed to a gas stream from engine exhaust "continuously flowing the gaseous mixtures into the reaction chamber" to obtain "continuous readouts" of the amount of nitric oxide in the sample. In other words, it contemplates measuring the total amount of nitric oxide in a continuously flowing gaseous mixture of unseparated nitrogen constituents. By contrast, in Fine each

nitrogen compound constituent of the gaseous sample is retained in the chromatograph for an individual time period so that each exits in discrete, time-separated pulses.* By this process, each constituent may be both identified by its position in time sequence, and measured. The claimed system, therefore, diverges from Warnick and teaches advantages not appreciated or contemplated by it.

[3] Because neither Warnick nor Eads, alone or in combination, suggests the claimed invention, the Board erred in affirming the Examiner's conclusion that it would have been obvious to substitute the Warnick nitric oxide detector for the Eads sulfur dioxide detector in the Eads system. *ACS Hosp. Sys.*, 732 F.2d at 1575–77, 221 USPQ at 931–33. The Eads and Warnick references disclose, at most, that one skilled in the art might find it obvious to try the claimed invention. But whether a particular combination might be "obvious to try" is not a legitimate test of patentability. *In re Geiger*, 815 F.2d 686, 688, 2 USPQ2d 1276, 1278 (Fed.Cir.1987); *In re Goodwin*, 576 F.2d 375, 377, 198 USPQ 1, 3 (CCPA 1978).

Obviousness is tested by "what the combined teachings of the references would have suggested to those of ordinary skill in the art." *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). But it "cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination." *ACS Hosp. Sys.*, 732 F.2d at 1577, 221 USPQ at 933. And "teachings of references can be combined *only* if there is some suggestion or incentive to do so." *Id.* Here, the prior art contains none.

Instead, the Examiner relies on hindsight in reaching his obviousness determination. But this court has said, "To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher." *W.L. Gore*, 721 F.2d at 1553, 220 USPQ at 312–13. It is essential that "the decisionmaker forget what he or she has been taught at trial about the claimed invention and cast the mind back to the time the invention was made . . . to occupy the mind of one skilled in the art who is presented only with the references, and who is normally guided by the then-accepted wisdom in the art." *Id.* One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.

C. Advantage Not Appreciated by the Prior Art.

[4] The Board erred not only in improperly combining the Eads and Warnick references but also in failing to appreciate that the appealed claims can be distinguished over that combination. A material limitation of the claimed system is that the conversion to nitric oxide occur in the range of 600°C to 1700°C. The purpose of this limitation is to prevent nitrogen from other sources, such as the air, from being converted to nitric oxide and thereby distorting the measurement of nitric oxide derived from the nitrogen compounds of the sample.

The claimed nitric oxide conversion temperature is not disclosed in Warnick. Although Eads describes a preferred temperature of 675°C to 725°C, the purpose of this range is different from that of Fine. Eads requires the 675°C to 725°C range because it affords a temperature low enough to avoid formation of unwanted sulfur trioxide, yet high enough to avoid formation of unwanted sulfides. Fine's temperature

* The Solicitor argues that the contents of Attachment C of Fine's brief were not before the Board and may not properly be considered here. However, we need not rely on Attachment C. It is merely illustrative of the qualitative separation of nitrogen compounds which occurs in Fine's system. The fact that the various constituents exit at discrete intervals is shown by the specification which was before the Board and which may appropriately be considered on appeal. *See, e.g., Astra–Sjuco, A.B. v. United States Int'l Trade Comm'n*, 629 F.2d 682, 686, 207 USPQ 1, 5 (CCPA 1980) (claims must be construed in light of specification).

range, in contrast, does not seek to avoid the formation of sulfur compounds or even nitrogen compounds. It enables the system to break down the nitrogen compounds of the sample while avoiding the destruction of background nitrogen gas. There is a partial overlap, of course, but this is mere happenstance. Because the purposes of the two temperature ranges are entirely unrelated, Eads does not teach use of the claimed range. *See In re Geiger*, 815 F.2d at 688, 2 USPQ2d at 1278. The Board erred by concluding otherwise.

D. Unexpected Results.

Because we reverse for failure to establish a *prima facie* case of obviousness, we need not reach Fine's contention that the Board failed to accord proper weight to the objective evidence of unexpected superior results. *Id.*

E. The "Flame" Claims.

Claims 62, 68, 69, 79, 85 and 86 relate to the oxygen-rich flame conversion means of the claimed invention. These "flame" claims depend from either apparatus claim 60 or method claim 77. Dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious. *Hartness Int'l, Inc. v. Simplimatic Eng'g Co.*, 819 F.2d 1100, 1108, 2 USPQ2d 1826, 1831 (Fed.Cir.1987); *In re Abele*, 684 F.2d 902, 910, 214 USPQ 682, 689 (CCPA 1982); *see also In re Sernaker*, 702 F.2d 989, 991, 217 USPQ 1, 3 (Fed.Cir.1983). In view of our conclusion that claims 60 and 77 are nonobvious, the dependent "flame" claims are also patentable.

CONCLUSION

The Board's decision affirming the Examiner's rejection of claims 60, 62, 63, 68, 69, 77, 79, 80, 85 and 86 of Fine's application as unpatentable over the prior art under 35 U.S.C. § 103 is

REVERSED.

EDWARD S. SMITH, Circuit Judge, dissenting.

I respectfully dissent. I am of the firm belief that the prior art references, relied upon by the PTO to establish its prima facie case of obviousness, in combination teach and suggest Fine's invention to one skilled in the art. Also, I firmly believe that Fine failed to rebut the PTO's prima facie case. On this basis, I would affirm the board's determination sustaining the examiner's rejection, pursuant to 35 U.S.C. § 103, of Fine's claims on appeal before this court.

PETROCHEM SERVICES, INC., Appellant,

v.

The UNITED STATES, Appellee.

No. 87-1382.

United States Court of Appeals, Federal Circuit.

Decided Jan. 26, 1988.

Government contractor appealed decision of the Armed Services Board of Contract Appeals denying contractor's claim for equitable adjustment of contract to remove oil spilled on naval base. The Court of Appeals, Nichols, Senior Circuit Judge, held that Government's duty to disclose superior knowledge was not legally discharged by Navy supervisor's oral representations, unless contractor's representative heard and understood representations.

Vacated and remanded.

1. United States ⇐70(30)

Disclosure of superior knowledge doctrine applies in situations were contractor undertakes to perform without vital knowledge of fact that affects performance costs

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Application of Calvin L. FOX.
Patent Appeal No. 8862.

United States Court of Customs and Patent Appeals.
Feb. 1, 1973.

Proceeding on appeal from rejection by Patent Office Board of Appeals of claims of application Serial No. 621,145. The Court of Customs and Patent Appeals, Rich, J., held that claims 1 through 5 of application relating to library for tape recordings were properly rejected for obviousness.

Affirmed.

Patents ⇐18

Claims 1 through 5 of application relating to library for tape recordings, were properly rejected for obviousness. 35 U.S.C.A. § 103.

Amster & Rothstein, New York City, attorneys of record, for appellant. Jesse Rothstein, New York City, of counsel.

S. Wm. Cochran, Washington, D. C., for the Commissioner of Patents. Jere W. Sears, Washington, D. C., of counsel.

Before MARKEY, Chief Judge, RICH, BALDWIN and LANE, Judges, and WATSON, Judge, United States Customs Court, sitting by designation.

RICH, Judge.

This appeal is from the decision of the Patent Office Board of Appeals affirming the rejection of all five claims in appellant's application, serial No. 621,145, filed March 7, 1967, for "Process for Audio Information Distribution," We affirm.

To epitomize the description of appellant's process in his specification in non-claim language, the invention consists of making, by conventional equipment, a tape-recording of a lecture or the like,[1] transmitting this master tape to a suitable distribution point, such as a school library, making a plurality of copies of the master tape at the library for use by those wishing to hear the lecture on their own playback equipment and at their own convenience, and letting the users bring back their tape copies when they are through with them and have new lectures reproduced thereon from other master tapes at the library, which would, of course, entail erasing the record then on the tape. As to the copying equipment at the library or other distribution point, the specification states:

> The recording device is of conventional design and the structural details thereof are not necessary for an understanding of the method of the present invention. For purposes of this description it suffices to note that the recording device which is employed is capable of accommodating at least one, and preferably three, so-called slave tapes in cartridges for recording an audio program of a selected one of the master tapes and of achieving this recording at a fraction of the 30 minute play-back time of the program. This, in an obvious manner, enables wide dissemination of the audio information of the master tapes.

There is one main claim and there are four dependent claims. In claim terminology, the first recording is the "master tape," the library is the "first remote location," the copies there made are tapes in "slave cartridges," [2] and the place where the listener plays his slave tape is "a further remote location." Claim 1 reads:

> 1. A method of transmitting audio information from an origin location to a first remote location and then, in multiple copies of such audio in-

1. The application states that the invention "relates generally to educational techniques."

2. What is clearly contemplated in practicing appellant's process is the use of the now ubiquitous tape "cassette," though the application does not refer to this particular species of "cartridge."

formation, to a plurality of further remote locations comprising the steps of:

(a) Recording at an origin location a plurality of programs of audio information on a plurality of individual master tapes, one for each program, and packaging said individual master tapes in individual master tape cartridges;

(b) Transmitting a plurality of said recorded programs in said master tape cartridges to a first remote location;

(c) Selectively recording at said first remote location onto at least one tape in a slave cartridge one said recorded program from a selected one of said master tape cartridges at a recording speed greater than the audio playback speed of said recorded program;

(d) Transporting said recorded slave tape cartridge from said first remote location to a further remote location;

(e) Reproducing the audio information on said transported slave tape cartridge at said further remote location;

(f) Transporting said slave tape cartridge back from said further remote location to said first remote location; and

(g) Repeating steps (c) through (f) herein repeatedly with different programs.

The examiner cited no prior art and rejected on two grounds: under 35 U.S.C. § 101 for the reason that the invention is "a method of doing business, i. e. subject matter which does not fall within any one of the statutory classes of invention," and under 35 U.S.C. § 103 for the reason that the invention would have been obvious to those of ordinary skill in the art at the time it was made in view of practices so well known that judicial notice may be taken thereof.

The board affirmed on both grounds, first discussing the obviousness rejection. It considered each element of the main claim and the details added by the dependent claims and held:

* * * we find nothing unobvious in claim 1 in view of what appellant has admitted in his specification to be old, and of material of which we can and do take judicial notice.

We find nothing in dependent claims 2 through 5 which would be unobvious in view of material as to which judicial notice may be taken.

It affirmed the § 101 rejection, though it knew of no case on the question of the patentability of a method of doing business "which is clear cut on this issue," in view of the "substantial dicta" in various cases which have discussed the question, holding that appellant's claims "do not fall within the class of a process," defined in 35 U.S.C. § 100.

OPINION

We affirm on the ground of obviousness and will not discuss the non-statutory subject matter issue. Appellant devotes the major portion of his brief to discussion of the "method of doing business" question and when it comes to the obviousness issue he has nothing of substance to say.

Appellant asserts that the board considered only the obviousness of the individual steps of the claims and failed to consider, as it should have, appellant's process as a whole. We find no indication that this was so.

Appellant nowhere denies the matters of common knowledge on which the obviousness rejection is based but argues, first, as to step (a) of claim 1, that he "is unaware of any system wherein individual master tapes are packaged in individual master tape cartridges." The board said that would be an obvious thing to do and we agree. Appellant's unawareness of such a system, if true, is irrelevant. We find no magic in the term "master tapes." They are simply tape recordings. Cartridges have long been a well known way of packaging tapes. There is certainly nothing unobvious about transporting a plurality of

tape recordings, dealing with a variety of subjects, in their individual cartridges, from their place of origin to some other place, as called for in steps (a) and (b). Secondly, appellant argues about whether step (g) of claim 1 calls for the *erasing* of the information on a tape returned by the user and the substitution of new material in its place. Appellant contends it does and the solicitor's brief argues that it does not. We do not regard this matter as crucial to the obviousness of the process as a whole. As did the board, we will take judicial notice of the fact that tape recorders commonly erase tape automatically when new "audio information" is recorded on a tape which already has a recording on it.

We agree with the solicitor's principal contentions that appellant's claims are directed to what is essentially a tape lending library operation wherein the library makes the copies as demand warrants and that all of the equipment and technical knowledge required to perform the claimed method is admittedly old. The latter admission is to be found in part in express statements in appellant's specification and in part is deducible from the fact that it assumes anyone desiring to carry out the process would know of the equipment and techniques to be used, none being specifically described.

Appellant attempts to make much of the fact that no prior art references were cited even though he requested the examiner to do so. The examiner saw no need to do so and stuck to the position which he expressed as follows:

> The well known tape library, quite clearly, is "a first remote location" as defined in the claims, the "origin" being the studio of a recording company from which "origin" tapes have been "transmitted" to the library. The library could certainly duplicate the tape for a number of simultaneous borrowers (who would then play the duplicate tape at a "further remote location") without resorting to anything unobvious. Official notice of the existence in the art of such recording and re-recording steps has been taken and, it would appear, rightly so.

In this court appellant has not denied the existence of the facts on which the examiner rested his obviousness rejection nor the added facts of which the board took judicial notice.

Appellant having failed to show error in the obviousness rejection, the decision of the board is affirmed.

Affirmed.

W.L. GORE & ASSOCIATES, INC.,
Appellant/Cross-Appellee,

v.

GARLOCK, INC.,
Appellee/Cross-Appellant.

Nos. 83-613, 83-614.

United States Court of Appeals,
Federal Circuit.

Nov. 14, 1983.

Patentee brought infringement action, and accused infringer counterclaimed for declaratory judgment of patent invalidity, noninfringement, fraudulent solicitation, and entitlement to attorney fees. The United States District Court for the Northern District of Ohio entered judgment holding patents invalid, and patentee appealed. The Court of Appeals, Markey, Chief Judge, held that: (1) claims 1 and 17 of patent No. 3,953,566 directed to processes for stretching highly crystalline, unsintered teflon were invalid; (2) accused infringer had not met burden of showing that claims 1, 9, 12, 14, 18, 35, 36, 43, 67, and 77 of patent No. 4,187,390 directed to products obtained by the processes of the companion patent had been anticipated by prior art; (3) accused infringer failed to prove that at time application was filed, specification was not enabling or that claims were indefinite; (4) accused infringer failed to sustain burden of proving, by clear and convincing evidence, sufficient facts from which fraudulent intent could be inferred; (5) District Court did not abuse its discretion in denying accused infringer's request for attorney fees; and (6) better practice was for District Court to decide both validity and infringement issues.

Affirmed in part, reversed in part, and remanded.

Davis, Circuit Judge, concurred in result in part and dissented in part and filed opinion.

1. Patents ⇐165(2)

It is the patent claims that measure or define the invention, for purpose of determining patent validity. 35 U.S.C.A. § 112.

2. Patents ⇐16(1)

Each claimed invention must be considered as a whole in determining validity of patent. 35 U.S.C.A. § 103.

3. Patents ⇐16(1)

Court's restriction of claimed multistep process to one step constitutes error, whether done at behest of patentee relying on restriction to establish infringement by one who employs only that one step in a process otherwise distinct, or at behest of an accused infringer relying on that restriction to establish invalidity by showing that one step in a prior art process otherwise distinct. 35 U.S.C.A. §§ 102, 102(a, b), 103.

4. Patents ⇐62(1)

Finding that limitations of claim of patent directed to processes for stretching highly crystalline, unsintered teflon were met by patentee's operation, before asserted date of his invention, of teflon tape-stretching machine previously invented and patented by patentee's father was supported by record, for purpose of determining whether claim of patent was anticipated by operation of machine. 35 U.S.C.A. § 102(a).

5. Patents ⇐324.55(2)

Fact that district court, bound by precedent at time of trial, applied preponderance of the evidence test in determining claim of patent to have been anticipated by prior art did not render clearly erroneous standard inapplicable on patentee's appeal. 35 U.S.C.A. § 102(a); Fed.Rules Civ.Proc. Rule 52(a), 28 U.S.C.A.

6. Patents ⇐51(1)

Fact that those using patentee's invention for stretching teflon may not have appreciated results was irrelevant to determination of whether claim of patent was anticipated by operation of patented teflon tape-stretching machine in patentee's shop

before asserted date of patentee's invention. 35 U.S.C.A. § 102(a).

7. Patents ⇐51(2)

Nonsecret use of a claimed process in the usual course of producing articles for commercial purposes is a public use. 35 U.S.C.A. § 102(a).

8. Patents ⇐75

Manufacturer's use of previously invented machine for producing stretched and unstretched teflon thread seal tape was not a "public use" of processes subsequently claimed in patent directed to processes for stretching highly crystalline, unsintered teflon, notwithstanding that manufacturer allegedly did not keep machine hidden from employees legally bound to keep their knowledge confidential and notwithstanding that another company's employees were shown machine to see if they could help increase its speed, where there was no evidence that viewer of machine could thereby learn anything of which process, among all possible processes, the machine used. 35 U.S.C.A. §§ 102(b), 282.

9. Patents ⇐80

Manufacturer's and inventor's secret commercialization of whatever process was used in inventor's machine for producing stretched and unstretched teflon thread seal tape could not be held a bar to grant of patent to patentee on that process where, if manufacturer offered and sold anything, it was only tape and not whatever process was used in producing it, and there was no evidence that public could learn claimed process by examining tape. 35 U.S.C.A. § 102(b).

10. Patents ⇐90(2)

As between a prior inventor who benefits from process by selling its product but suppresses, conceals, or otherwise keeps process from public, and later inventor who promptly files patent application from which public will gain disclosure of process, law favors the latter. 35 U.S.C.A. § 102(b).

11. Patents ⇐16.8

Failure, in review of prior art with respect to patent directed to processes for stretching highly crystalline, unsintered teflon, to take into account import of markedly different behavior of such teflon from that of conventional thermoplastic polymers, consideration of patent claims in less than their entireties, and disregard of disclosures in prior art references that diverged from and taught away from invention at hand were error. 35 U.S.C.A. § 103.

12. Patents ⇐16.25

Disclosure in prior patents that unsintered teflon article could be stretched to as much as four times its length encompassed step of stretching to twice its length set forth in claim 17 of patent No. 3,953,566 directed to processes for stretching highly crystalline, unsintered teflon and established that such step would have been obvious, and thus claim was invalid. 35 U.S.C.A. § 103.

13. Patents ⇐112.1

Presumption of validity of patent has no separate evidentiary value; it cautions decision maker against rush to conclude invalidity, and submission of additional art that is merely "pertinent" does not dispel that caution. 35 U.S.C.A. § 103.

14. Patents ⇐312(1⅛)

Burden of persuasion remains throughout trial on one who would prove invalidity of patent. 35 U.S.C.A. §§ 103, 282.

15. Patents ⇐36.1(1)

Refusal to consider objective evidence of nonobviousness of processes taught by patent was error. 35 U.S.C.A. § 103.

16. Patents ⇐312(6)

Accused infringer failed to meet burden of proving that invention which was subject of claims of patent directed to processes for stretching highly crystalline, unsintered teflon and teaching that such teflon could be stretched at a rate of about 100% per second or to more than five times its original length would have been obvious, even though individual parts of separate prior art references could be employed to recreate facsimile of claimed invention. 35 U.S.C.A. § 103.

17. Patents ⇐51(1)

Anticipation requires disclosure in a single prior art reference of each element of claim under consideration. 35 U.S.C.A. § 102.

18. Patents ⇐51(1)

Anticipation of inventions set forth in product claims cannot be predicated on mere conjecture respecting characteristics of products that might result from practice of processes disclosed in references. 35 U.S.C.A. § 102.

19. Patents ⇐66(1.24)

Teachings of prior art references were so unacceptably vague concerning characteristics of products produced by their respective processes as not to support anticipation rejection of claims of patent directed to products obtained by companion processes for stretching highly crystalline, unsintered teflon where neither of prior art references disclosed an invention set forth in any claim of subject patent, no inter partes tests in which processes taught by prior art references were conducted were of record, no products of those processes were placed in evidence, and "effect" of processes disclosed in prior art references was undisclosed in those patents. 35 U.S.C.A. § 102.

20. Patents ⇐66(1.24)

Accused infringer's employment of process covered by patent cited as prior art reference was irrelevant to determination of anticipation of claims of patent directed to products obtained by companion processes for stretching highly crystalline, unsintered teflon, even assuming cited patent was a dominating patent, where there was no basis for finding that cited process in itself necessarily and inherently resulted in products which were subject of claims of patent. 35 U.S.C.A. § 102.

21. Patents ⇐66(1.24)

Accused infringer's employment of process of dominating patent does not render that employment an anticipation of an invention described and claimed in an improvement patent. 35 U.S.C.A. § 102.

22. Patents ⇐62(1)

Accused infringer had not met burden of showing that claims of patent directed to products obtained by companion processes for stretching highly crystalline, unsintered teflon were anticipated by prior art preferences, neither of which disclosed an invention set forth in any claim of patent. 35 U.S.C.A. § 102.

23. Patents ⇐16(2)

Apparent assumption that products which were subject of patent claims, having been found inherent in processes of prior art references, would have been obvious in view of those references was error. 35 U.S.C.A. § 103.

24. Patents ⇐16(1)

Inherency and obviousness are distinct concepts for patent purposes. 35 U.S.C.A. § 103.

25. Patents ⇐36(1)

All evidence bearing on issue of obviousness, as with any other issue raised in conduct of judicial process, must be considered and evaluated before required legal conclusion is reached. 35 U.S.C.A. § 103.

26. Patents ⇐36(1)

Objective evidence of nonobviousness may in a given case be entitled to more weight or less, depending on its nature and its relationship to merits of invention, and it should when present always be considered as an integral part of analysis on obvious/nonobvious issue. 35 U.S.C.A. § 103.

27. Patents ⇐101(5)

A claim to a new product is not legally required to include critical limitations. 35 U.S.C.A. § 103.

28. Patents ⇐16.25

In view of difficulty of working with unsintered teflon and its unpredictable response to various processing techniques, vagueness of prior art references concerning products produced by those processes, and filling of at least two long-felt needs by and commercial success of claimed inventions, inventions set forth in claims of patent directed to products obtained by com-

panion processes talline, unsinte been obvious to those invention § 103.

29. Patents ⇐

Patents ar skilled in the ar the invention.

30. Patents ⇐

Statute re sufficient infor ordinary skill i the invention filing date, not U.S.C.A. § 112

31. Patents ⇐

Postfiling formulae for c sintered teflon tion of whe processes for unsintered tefl such processes tion to enable to make and statute. 35 U.

32. Patents ⇐

Statute re sufficient info ordinary skill i tion requires mode of pract at time applic § 112.

33. Patents ⇐

Use of p rate exceedi second" in c processes for unsintered te purpose of where infring use of stopwa

34. Patents ⇐

Absence directed to p crystalline, u

panion processes for stretching highly crystalline, unsintered teflon would not have been obvious to those skilled in art at time those inventions were made. 35 U.S.C.A. § 103.

29. Patents ⇐1

Patents are written to enable those skilled in the art, not the public, to practice the invention. 35 U.S.C.A. § 112.

30. Patents ⇐99

Statute requiring that patents disclose sufficient information to enable a person of ordinary skill in the art to make and use the invention speaks as of the application filing date, not as of the time of trial. 35 U.S.C.A. § 112.

31. Patents ⇐99

Postfiling date development of varying formulae for calculating stretch rate of unsintered teflon was irrelevant to determination of whether patents directed to processes for stretching highly crystalline, unsintered teflon and products obtained by such processes disclosed sufficient information to enable person of ordinary skill in art to make and use invention, as required by statute. 35 U.S.C.A. § 112.

32. Patents ⇐99

Statute requiring that patents disclose sufficient information to enable person of ordinary skill in art to make and use invention requires that inventor set forth best mode of practicing invention known to him at time application was filed. 35 U.S.C.A. § 112.

33. Patents ⇐101(6)

Use of phrase "stretching * * * at a rate exceeding about ten percent per second" in claims of patent directed to processes for stretching highly crystalline, unsintered teflon was not indefinite, for purpose of assessment of infringement, where infringement was assessable through use of stopwatch. 35 U.S.C.A. § 112.

34. Patents ⇐101(4)

Absence from specification of patent directed to processes for stretching highly crystalline, unsintered teflon of a method for calculating minimum rate of stretch above 35 degrees centigrade did not render specification nonenabling, notwithstanding that minimum rate of stretch might increase with temperature, where calculation of minimum stretch rate above 35 degrees centigrade was not in claims of patent and particularly in absence of convincing evidence that those skilled in art would have found specification nonenabling at time application was filed. 35 U.S.C.A. § 112.

35. Patents ⇐99

It is the claimed invention for which enablement is required. 35 U.S.C.A. § 112.

36. Patents ⇐101(11)

Patents directed to processes for stretching highly crystalline, unsintered teflon and to products obtained by such processes were not invalid for indefiniteness on ground that some trial and error would be needed to determine lower limits of stretch rate above ten percent per second at various temperatures above 35 degrees centigrade where there was no evidence or finding that undue experimentation was required. 35 U.S.C.A. § 112.

37. Patents ⇐99

A patent is not invalid because of need for experimentation. 35 U.S.C.A. § 112.

38. Patents ⇐99

A patent is invalid only when those skilled in art are required to engage in undue experimentation to practice the invention. 35 U.S.C.A. § 112.

39. Patents ⇐165(1)

Distinguishing what infringes from what doesn't is role of patent claims, not of patent specification. 35 U.S.C.A. § 112.

40. Patents ⇐98

A patent applicant may be his own lexicographer.

41. Patents ⇐101(11)

In light of disclosure of its calculation in patent specification, term "matrix tensile strength" in claims of patents directed to processes for stretching highly crystalline, unsintered teflon and to products obtained

by such processes was neither indefinite nor nonenabling. 35 U.S.C.A. § 112.

42. Patents ⇐101(11)

Absence from specification of patents directed to processes for stretching highly crystalline unsintered teflon and to products obtained by such processes of a definition for "specific gravity of the solid polymer," which was a part of computation of matrix tensile strength, did not render that computation indefinite where there was no testimony that specific gravity values used in application were not known to persons of ordinary skill in art or could not be calculated or measured. 35 U.S.C.A. § 112.

43. Patents ⇐312(4)

Fraud on the Patent and Trademark Office must be shown by clear and convincing evidence.

44. Patents ⇐312(6)

Accused infringer failed to sustain burden of proving, by clear and convincing evidence, sufficient facts from which fraudulent intent could be inferred from patentee's representations to Patent and Trademark Office that stretching unsintered teflon tape at rate greater than ten percent per second was not novel and that it produced a physical phenomenon.

45. Patents ⇐312(6)

Finding in 1982 that teflon tape-stretching machine invented and patented by patentee's father inherently stretched tape at some time in 1969 at a rate more than ten percent per second did not establish that patentee of patents directed to processes for stretching highly crystalline, unsintered teflon and to products obtained by such processes was aware of that fact in 1975, nor make untrue his statement that to his knowledge such had not been the rate of stretch employed, for purpose of determining fraud on the Patent and Trademark Office.

46. Patents ⇐312(6)

Evidence of patentee's isolated statements did not support the conclusion, for purpose of determining fraud on the Patent and Trademark Office, that patentee of patents directed to processes for stretching highly crystalline, unsintered teflon and to products obtained by such processes attempted to convince PTO that a physical phenomenon always existed in which stretching at a rate greater than ten percent per second always produced a matrix tensile strength greater than 7,300 pounds per square inch.

47. Patents ⇐325.11(3)

Denial of accused infringer's request for attorney fees on counterclaim for declaratory judgment of patent invalidity in patentee's infringement action was not abuse of discretion.

48. Patents ⇐324.60

Where appellate court reverses a holding of invalidity, and remand is ordered for trial of factual issue of infringement, better practice is for district court to decide both validity and infringement issues when both are contested at trial, enabling conduct of single appeal and disposition of entire case in a single appellate opinion.

David H. Pfeffer, New York City, argued for appellant/cross-appellee; J. Robert Dailey and Janet Dore, New York City, John S. Campbell, Newark, Del., of counsel.

John J. Mackiewicz, Philadelphia, Pa., argued for appellee/cross-appellant. With him on the brief were Dale M. Heist, Philadelphia, Pa., Bernard Ouziel, New York City, of counsel.

Before MARKEY, Chief Judge, and DAVIS and MILLER, Circuit Judges.

MARKEY, Chief Judge.

Appeal from a judgment of the District Court for the Northern District of Ohio holding U.S. Patents 3,953,566 ('566) and 4,187,390 ('390) invalid. We affirm in part, reverse in part, and remand for a determination of the infringement issue.

Background

Tape of unsintered polytetrafluorethylene (PTFE) (known by the trademark

TEFLON of E.I. du Pont de Nemours, Inc.) had been stretched in small increments. W.L. Gore & Associates, Inc. (Gore), assignee of the patents in suit, experienced a tape breakage problem in the operation of its "401" tape stretching machine. Dr. Robert Gore, Vice President of Gore, developed the invention disclosed and claimed in the '566 and '390 patents in the course of his effort to solve that problem. The 401 machine was disclosed and claimed in Gore's U.S. Patent 3,664,915 ('915) and was the invention of Wilbert L. Gore, Dr. Gore's father. PTFE tape had been sold as thread seal tape, i.e., tape used to keep pipe joints from leaking. The '915 patent, the application for which was filed on October 3, 1969, makes no reference to stretch rate, at 10% per second or otherwise, or to matrix tensile strength in excess of 7,300 psi.

Dr. Gore experimented with heating and stretching of highly crystalline PTFE rods. Despite slow, careful stretching, the rods broke when stretched a relatively small amount. Conventional wisdom in the art taught that breakage could be avoided only by slowing the stretch rate or by decreasing the crystallinity. In late October, 1969, Dr. Gore discovered, contrary to that teaching, that stretching the rods as fast as possible enabled him to stretch them to more than ten times their original length with no breakage. Further, though the rod was thus greatly lengthened, its diameter remained virtually unchanged throughout its length. The rapid stretching also transformed the hard, shiny rods into rods of a soft, flexible material.

Gore developed several PTFE products by rapidly stretching highly crystalline PTFE, including: (1) porous film for filters and laminates; (2) fabric laminates of PTFE film bonded to fabric to produce a remarkable material having the contradictory properties of impermeability to liquid water and permeability to water vapor, the material being used to make "breathable" rainwear and filters; (3) porous yarn for weaving or braiding into other products, like space suits and pump packing; (4) tubes used as replacements for human arteries and veins; and (5) insulation for high performance electric cables.

On May 21, 1970, Gore filed the patent application that resulted in the patents in suit. The '566 patent has 24 claims directed to processes for stretching highly crystalline, unsintered, PTFE. The processes, *inter alia*, include the steps of stretching PTFE at a rate above 10% per second and at a temperature between about 35°C and the crystalline melt point of PTFE. The '390 patent has 77 claims directed to various products obtained by processes of the '566 patent.

It is effectively undisputed that the present inventions filled a long sought yet unfilled need. The United States Army and the research director of a Garlock, Inc. (Garlock) customer had been looking for and following up every remote lead to a waterproof/breathable material for many years.

It is undisputed that the present inventions enjoyed prompt and remarkable commercial success due to their merits and not to advertising or other extraneous causes.

It is undisputed that the inventions provide the most important synthetic material available for use in vascular surgery, hundreds of thousands of persons having received artificial arteries formed of the patented product since 1976, and that the patented products have unique properties useful in other medical procedures, in communications satellites, radar systems, and electrical applications.

It is undisputed that the major sources of PTFE, ICI and du Pont, greeted the patented product as "magical", "bewitching", "a remarkable new material", and one that "differs from other processed forms of Teflon".

It is undisputed that the patented products were met with skepticism and disbelief by at least one scientist who had worked with PTFE at du Pont for many years and who testified as an expert at trial.

It is undisputed that Garlock first produced an accused product in response to a customer's request for a substitute for the

patented product, that Garlock advertised its accused product as a "new form" of PTFE and as "a versatile new material which provides new orders of performance for consumer, industrial, medical and electrical applications", and that the customer describes that accused product as "a new dimension in rainproof/breathable fabrics".

Proceedings

On Nov. 2, 1979, Gore sued Garlock for infringement of process claims 3 and 19 of the '566 patent, and sought injunctive relief, damages, and attorney fees. Garlock counterclaimed on Dec. 18, 1979, for a declaratory judgment of patent invalidity, non-infringement, fraudulent solicitation, and entitlement to attorney fees. On Feb. 7, 1980, Gore filed a second suit for infringement of product claims 14, 18, 36, 43, 67 and 77 of the '390 patent. In light of a stipulation, the district court consolidated the two suits for trial.

Gore alleged infringement of certain claims by certain products:

'566 patent claims	'390 patent claims	Garlock Product
19	14, 43	film
--	36, 77	laminate
19	18	yarn
--	67	braided packing
3	--	tape

At trial, Garlock addressed only claims 1, 3, 17, and 19 of the '566 patent and claims 1, 9, 12, 14, 18, 35, 36, 43, 67, and 77 of the '390 patent. See Appendix to this opinion.

The district court, in a thorough memorandum accompanying its judgment, and in respect of the '566 patent: (1) found claim 1 anticipated under 35 U.S.C. § 102(a) by Gore's use of its 401 machine and use by the Budd Company (Budd) of a Cropper machine; (2) declared all claims of the patent invalid under 102(b) because the invention had been in public use and on sale more than one year before Gore's patent application, as evidenced by Budd's use of the Cropper machine; (3) held claims 1, 3, 17 and 19 invalid for obviousness under 35 U.S.C. § 103, on the basis of various reference pairings: (a) Japanese patent 13560/67 (Sumitomo) with U.S. patent 3,214,503 (Markwood); (b) U.S. patent 2,776,465 (Smith) with Markwood; or (c) Gore's '915 patent with Sumitomo; and (4) held all claims invalid as indefinite under 35 U.S.C. § 112.[1]

In its opinion respecting the '390 patent, the district court held: (1) claims 1, 9, 12, 14, 18, 35, 36, 43, 67 and 77 invalid under §§ 102 and 103 in view of Sumitomo and Smith; and (2) all claims invalid as indefinite under § 112.

1. 35 U.S.C. § 102(a) and (b) provide:

A person shall be entitled to a patent unless—

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States, or ...

35 U.S.C. § 103 provides:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

35 U.S.C. § 112 provides:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention. A claim may be written in independent or dependent form, and if in dependent form, it shall be construed to include all the limitations of the claim incorporated by reference into the dependent claim.

The court found that Gore did not commit fraud before the Patent and Trademark Office (PTO), denied Garlock's request for attorney fees, and refrained from deciding the infringement issue.

Issues

Did the district court err in: (1) its holdings of invalidity under §§ 102(a), 102(b), 103 and 112; (2) its finding that Gore did not commit fraud on the PTO; or (3) denying attorney fees.

OPINION

This hard fought and bitterly contested case involved over two years of discovery, five weeks of trial, the testimony of 35 witnesses (19 live, 16 by deposition), and over 300 exhibits. The district court issued an exhaustive 37-page memorandum opinion reflective of a careful, conscientious approach to the determination of the many issues presented at trial.

The record on appeal consists of 2000 pages. The parties' briefs total 199 pages. In those briefs, counsel repeatedly accuse each other of numerous and serious breaches of the duty of candor owed the court. Each cites instances in which the testimony, the findings, and the record are or are said to be quoted in part and out of context. As a result, the usefulness and reliability of the briefs as means of informing the court has been greatly diminished if not destroyed, and careful, time-consuming study of all exhibits and each page of the record has been required.

Appellant cited 80 prior court opinions in its main brief. Appellee's brief totally ignores all but two of those citations, but adds 57 more. Appellant's reply brief cites 126 prior court opinions, 34 earlier cited, 67 newly cited, and 25 of those cited by appellee. Appellee's reply brief cites 17 prior court opinions, 4 earlier cited, 7 newly cited, and 6 of the 147 cited by appellant. Accordingly, 211 prior court opinions have been evaluated in relation to the proof found in the record.

In light of the entire record and the applicable law, we are convinced that Garlock failed to carry its burden of proving all claims of the present patents invalid.

Standard of Review

Where, as here, dispositive legal error occurred in interpretation and application of the patent statute, 35 U.S.C., the parties' arguments relating to the salutory injunction of Fed.Rule Civ.P. 52(a) cannot be controlling on all issues. Findings that "rest on an erroneous view of the law may be set aside on that basis", *Pullman-Standard v. Swint*, 456 U.S. 273, 102 S.Ct. 1781, 42 L.Ed.2d 66 (1982). Thus it is unnecessary here to set aside any probative fact found by the district court on the basis of its being clearly erroneous, or to engage in what would be an inappropriate reweighing of the facts.

Among the legal errors extant in the record, each of which is discussed below, are (1) the invention set forth in each claim was not in each instance considered as a whole; (2) 35 U.S.C. § 102(b) was applied though criteria for its application were not present; (3) the references were not assessed in their entireties; (4) an inherency theory under §§ 102 and 103 was inappropriately applied; (5) that which only the inventor taught was attributed to the prior art; (6) individual steps in prior art processes dealing with materials distinct from those with which the present inventions dealt were erroneously equated to steps in the claimed processes; (7) objective evidence of nonobviousness was disregarded; and (8) the function and application of § 112 were misconstrued.

Because it permeated so much of the district court's analysis, we note more fully its frequent restriction of its consideration to 10% per second rate of stretching, which it called the "thrust of the invention". That approach is repeated throughout Garlock's briefs, which refer repeatedly to the "thrust of the invention", to "the inventive concept", and to the claims "shorn of their extraneous limitations". That facile focusing on the "thrust", "concept", and "shorn" claims, resulted in treating the claims at many points as though they read differently from those actually allowed and in suit.

[1] It is true that Dr. Gore emphasized rapid stretching, for example, as well as the amount of stretch and other process limitations, during prosecution of the application for the '566 patent. Yet it is the claims that measure and define the invention. *Aro Manufacturing Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 339, 81 S.Ct. 599, 600, 5 L.Ed.2d 592 (1961); *Bowser, Inc. v. U.S.*, 388 F.2d 346, 349, 156 USPQ 406, 409 (Ct.Cl.1967).

[2, 3] Each claimed invention must be considered as a whole. 35 U.S.C. § 103; *Schenck, A.G. v. Nortron Corp.*, 713 F.2d 782, 218 USPQ 698, 700 (Fed.Cir.1983). In determining obviousness, there is "no legally recognizable or protected 'essential', 'gist', or 'heart' of the invention". *Aro*, 365 U.S. at 345, 81 S.Ct. at 604. A court's restriction of a claimed multi-step process to one step constitutes error, whether done at the behest of a patentee relying on that restriction to establish infringement by one who employs only that one step in a process otherwise distinct, or at the behest of an accused infringer relying on that restriction to establish invalidity by showing that one step in a prior art process otherwise distinct.

(1) *Invalidity*

(a) *'566 Patent*

(i) *§ 102(a) and The 401 Machine*

It is undisputed that the district court held only claim 1 of the '566 patent to have been anticipated under § 102(a) by operation of the 401 machine in the Gore shop before Dr. Gore's invention in late October 1969. It did so on the deposition testimony of two former Gore employees, documents, and drawings of the 401 machine.

[4] In August, 1969, Gore offered to sell to Export Tool Company (Export) tape "to be made" on the 401 machine. Tape made on the 401 machine was shipped to Export on October 24, 1969. The trial judge found the rolls on the 401 machine were, at least at some point in time before October 1969, spaced less than four feet apart and that the rate of stretch accomplished in operating that machine (admittedly operated in accord with the description of machine operation in the '915 patent) must have been greater than 10% per second. The district court credited testimony that Teflon 6–c, a highly crystalline form of Teflon, was used because it was the standard resin at the time, and that the tape was stretched at a temperature above 35°C. Thus it cannot be said that the record fails to support the district court's finding that the limitations of claim 1 were met by Gore's operation of the 401 machine before Dr. Gore's asserted "late October, 1969" date of invention. Though he was working with the operation of the 401 machine, Dr. Gore offered no proof that his invention date was before the date of shipment to Export.

[5] Gore, seeking a review here of the evidence, points to certain inadequacies as indicating a failure to meet the required clear and convincing standard under § 102(a). At the time of trial, the district court, bound by precedent then applicable, applied a preponderance of the evidence test. Gore asserts, erroneously, that the clearly erroneous standard does not therefore apply on this appeal. Gore does not, however, point to any basis on which the district court's findings must be held to have been clearly erroneous under the clear and convincing standard. We are not at liberty, of course, to substitute our own for the district court's findings underlying its conclusion that claim 1 is invalid.

[6] Gore's operation of the 401 machine must thus be viewed as a consistent, reproducible use of Dr. Gore's invention as set forth in claim 1, and it is therefore irrelevant that those using the invention may not have appreciated the results. *General Electric Co. v. Jewel Incandescent Lamp Co.*, 326 U.S. 242, 248, 66 S.Ct. 81, 83, 90 L.Ed. 43, 67 USPQ 155, 157–58 (1945). Were that alone enough to prevent anticipation, it would be possible to obtain a patent for an old and unchanged process. *Ansonia Brass & Copper Co. v. Electric Supply Co.*, 144 U.S. 11, 18, 12 S.Ct. 601, 604, 36 L.Ed. 327 (1892); *see, H.K. Regar & Sons, Inc. v.*

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(ii) *§ 102(b)*

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Scott & Williams, Inc., 63 F.2d 229, 231, 17 USPQ 81, 83 (2d Cir.1933).

[7] The nonsecret use of a claimed process in the usual course of producing articles for commercial purposes is a public use. *Electric Storage Battery Co. v. Shimadzu*, 307 U.S. 5, 20, 59 S.Ct. 675, 684, 83 L.Ed. 1071, 41 USPQ 155, 161 (1939), and there was no evidence that any different process was used to produce the articles shipped to Export.

Thus it cannot be said that the district court erred in determining that the invention set forth in claim 1 of '566 patent was known or used by others under § 102(a), as evidenced by Gore's operation of the 401 machine before Dr. Gore's asserted date of that invention.

In view of our affirmance of the judgment reached on claim 1 under 102(a), we need not discuss other asserted grounds of invalidity of claim 1. There was, however, no evidence whatever that the inventions set forth in other claims, of either the '566 or the '390 patent, were known or used by others as a result of Gore's operation of the 401 machine before late October, 1969.

(ii) *§ 102(b) and the Cropper Machine*

In 1966 John W. Cropper (Cropper) of New Zealand developed and constructed a machine for producing stretched and unstretched PTFE thread seal tape. In 1967, Cropper sent a letter to a company in Massachusetts, offering to sell his machine, describing its operation, and enclosing a photo. Nothing came of that letter. There is no evidence and no finding that the present inventions thereby became known or used in this country.

In 1968, Cropper sold his machine to Budd, which at some point thereafter used it to produce and sell PTFE threat seal tape. The sales agreement between Cropper and Budd provided:

> *ARTICLE "E"—PROTECTION OF TRADE SECRETS Etc.*
>
> *1. BUDD* agrees that while this agreement is in force it will not reproduce any copies of the said apparatus without the express written permission of Cropper nor will it divulge to any person or persons other than its own employees or employees of its affiliated corporations any of the said known-how or any details whatsoever relating to the apparatus.
>
> *2. BUDD* agrees to take all proper steps to ensure that its employees observe the terms of Article "E" 1 and further agrees that whenever it is proper to do so it will take legal action in a Court of competent jurisdiction to enforce any one or more of the legal or equitable remedies available to a trade secret plaintiff.

Budd told its employees the Cropper machine was confidential and required them to sign confidentiality agreements. Budd otherwise treated the Cropper machine like its other manufacturing equipment.

[8] A former Budd employee said Budd made no effort to keep the secret. That Budd did not keep the machine hidden from employees legally bound to keep their knowledge confidential does not evidence a failure to maintain the secret. Similarly, that du Pont employees were shown the machine to see if they could help increase its speed does not itself establish a breach of the secrecy agreement. There is no evidence of when that viewing occurred. There is no evidence that a viewer of the machine could thereby learn anything of which process, among all possible processes, the machine is being used to practice. As Cropper testified, looking at the machine in operation does not reveal whether it is stretching, and if so, at what speed. Nor does looking disclose whether the crystallinity and temperature elements of the invention set forth in the claims are involved. There is no evidence that Budd's secret use of the Cropper machine made knowledge of the claimed process accessible to the public.

The district court held all claims of the '566 patent invalid under 102(b), *supra*, note 3, because "the invention" was "in public use [and] on sale" by Budd more than one year before Gore's application for patent. Beyond a failure to consider each of the claims independently, 35 U.S.C. § 282; *Altoona Publix Theatres, Inc. v. American*

Tri-Ergon Corp., 294 U.S. 477, 487, 55 S.Ct. 455, 459, 79 L.Ed. 1005 (1935), and a failure of proof that the claimed inventions as a whole were practiced by Budd before the critical May 21, 1969 date, it was error to hold that Budd's activity with the Cropper machine, as above indicated, was a "public" use of the processes claimed in the '566 patent, that activity having been secret, not public.

Assuming, arguendo, that Budd sold tape produced on the Cropper machine before October 1969, and that that tape was made by a process set forth in a claim of the '566 patent, the issue under § 102(b) is whether that sale would defeat Dr. Gore's right to a patent on the process inventions set forth in the claims.

[9] If Budd offered and sold anything, it was only tape, not whatever process was used in producing it. Neither party contends, and there was no evidence, that the public could learn the claimed process by examining the tape. If Budd and Cropper commercialized the tape, that could result in a forfeiture of a patent granted them for their process on an application filed by them more than a year later. *D.L. Auld Co. v. Chroma Graphics Corp.*, 714 F.2d 1144, at 1147–48 (Fed.Cir.1983); *See Metallizing Engineering Co. v. Kenyon Bearing & Auto Parts Co.*, 153 F.2d 516, 68 USPQ 54 (2d Cir.1946). There is no reason or statutory basis, however, on which Budd's and Cropper's secret commercialization of a process, if established, could be held a bar to the grant of a patent to Gore on that process.

[10] Early public disclosure is a linchpin of the patent system. As between a prior inventor who benefits from a process by selling its product but suppresses, conceals, or otherwise keeps the process from the public, and a later inventor who promptly files a patent application from which the public will gain a disclosure of the process, the law favors the latter. *See Horwath v. Lee*, 564 F.2d 948, 195 USPQ 701 (CCPA 1977). The district court therefore erred as a matter of law in applying the statute and in its determination that Budd's secret use of the Cropper machine and sale of tape rendered all process claims of the '566 patent invalid under § 102(b).

(iii) *§ 103*

In considering claims 1, 3, 17, and 19 of the '566 patent, the district court recognized that analysis of the obviousness issue under § 103 requires determination of the scope and content of the prior art, the differences between the prior art and the claims at issue, and the level of ordinary skill in the pertinent art. *Graham v. John Deere Co.*, 383 U.S. 1, 17, 86 S.Ct. 684, 693, 15 L.Ed.2d 545, 148 USPQ 459, 467 (1966).

[11] In its consideration of the prior art, however, the district court erred in not taking into account the import of the markedly different behavior of PTFE from that of conventional thermoplastic polymers clearly established and undisputed on the record, and in thus disregarding the unpredictability and unique nature of the unsintered PTFE to which the claimed inventions relate, *In re Whiton*, 420 F.2d 1082, 164 USPQ 455 (CCPA 1970); in considering claims in less than their entireties, *Schenck, supra;* and in considering the references in less than their entireties, i.e., in disregarding disclosures in the references that diverge from and teach away from the invention at hand. *In re Kuderna*, 426 F.2d 385, 165 USPQ 575 (CCPA 1970).

Invalidity of claim 1 under § 102(a) having been determined, it is unnecessary to discuss in detail the applicability of § 103 to that claim. If claim 1 had not been held anticipated under § 102(a) in light of operation of the 401 machine, it is clear from the discussion here that claim 1 could not properly have been held invalid under § 103.

Claim 3 depends from and thus incorporates claim 1 but specifies a rate of stretch of 100% per second. Claim 17 also depends from claim 1 and specifies an amount of stretch of about twice the original length. Claim 19 depends from claim 17 but specifies an amount of stretch of about five times the original length.

U.S. patent 2,983,961 to Titterton, Volume 13 of the *Encyclopedia of Polymer*

Science and Technology (1970), the Sumitomo patent, and witnesses for both parties, establish that teachings related to conventional thermoplastic polymers are inapplicable to PTFE.

Articles by Dogliotti and Yelland, *Effect of Strain Rate on the Viscoelastic Properties of High Polymeric Fibrous Materials*, 4 High Speed Testing 211 (1964) and Robinson and Graham, *Methods of Characterization of Polymeric Materials by High Speed Testing Techniques*, 5 High Speed Testing 261 (1965), teach that conventional plastics and sintered PTFE can be stretched further if stretched slowly. Dr. Gore demonstrated at trial and at oral argument before us that an attempt to stretch highly crystalline, unsintered PTFE slowly results in breakage, and that rapid stretching produces a greatly lengthened rod of soft, flexible material.

The '566 patent contains an example of stretching an article to 16 times its length. Smith and the '915 patent teach that PTFE could not be stretched beyond four times its length without heating it to above its crystalline melt temperature, a step avoided by Dr. Gore and as set forth in the claims.

Sumitomo teaches that there is a length limit to stretching unsintered PTFE, and does not suggest what that limit might be. Markwood, U.S. patent 3,208,100 to Nash (Nash), and U.S. patent 2,823,421 to Scarlett (Scarlett) teach that *non-PTFE* thermoplastics can be stretched rapidly and to extended lengths, and *also* teach reduction, elimination, or avoidance of crystallinity before stretching.

[12] The disclosure in the Smith and '915 patents that a PTFE article may be stretched to as much as four times its length encompasses the step of stretching to twice its length set forth in claim 17 and establishes that such step would have been obvious.

Claims 3 and 19 must be considered individually and separately. 35 U.S.C. § 282. Nowhere, in any of the references, is it taught or suggested that highly crystalline, unsintered PTFE could be stretched at a rate of about 100% per second as required by asserted claim 3. Nor is it anywhere suggested that by rapid stretching a PTFE article be stretched to more than five times its original length as required by asserted claim 19. On the contrary, the art as a whole teaches the other way.

In concluding that obviousness was established by the teachings in various pairs of references, the district court lost sight of the principle that there must have been something present in those teachings to suggest to one skilled in the art that the claimed invention before the court would have been obvious. *In re Bergel*, 292 F.2d 955, 956–57, 130 USPQ 206, 208 (CCPA 1961); *In re Sponnoble*, 405 F.2d 578, 585, 160 USPQ 237, 244 (CCPA 1969).

The court's pairing of Sumitomo and Markwood disregarded, as above indicated, the undisputed evidence that the unsintered PTFE of Sumitomo does not respond to the conventional plastics processing of Markwood and the art recognition of that fact. *Whiton, supra*, 420 F.2d at 1085, 164 USPQ at 457.

In evaluating claim 19, for example, the pairing disregarded Sumitomo's limited length of stretch teaching. In evaluating claim 3, the court recognized that Sumitomo made no mention of rate of stretch. Looking to Markwood to supply that teaching disregarded not only the conventional plastics-unsintered PTFE distinction but also the clear divergence of Markwood's teaching that crystallinity must be reduced or avoided from the presence of "highly crystalline" in all claims of the '566 patent.

Similarly, and for many of the same reasons, the pairing of Markwood's and Smith's teachings was an inappropriate basis for concluding that the processes set forth in claims 3 and 19 would have been obvious. As above indicated, Markwood's rapid stretching of conventional plastic polypropylene with reduced crystallinity would not suggest rapid stretching of highly crystalline PTFE, in light of teachings in the art that PTFE should be stretched slowly. The Smith patent is owned by du Pont, where Dr. Gore's process invention was considered

to have produced a "remarkable new material". That circumstance is not surprising, for Smith, though dealing with PTFE, says not a word about any rate of stretch.

Lastly, the pairing of Sumitomo and the '915 patent suffers from the same shortcomings. The pairing resulted from a hypothetical set forth in Garlock's post trial brief, and was based on no testimony or other evidence in the record. In respect of claim 3, neither reference mentions rate of stretch or suggests its importance. In respect of claim 19 both references point away from the claimed invention in their limited length-of-stretch teachings. The '915 patent states: "the 65 percent expanded material could be expanded a second time for an additional 65 percent expansion or a total length increase ratio of 1:2.72 [less than three times the original length]. However, great care was necessary to obtain a uniformly expanded material at these very great expansion ratios." Thus the '915 patent suggests that the amount of stretch of 500% set forth in claim 19 (more than five times the original length) is not possible.

As indicated, Sumitomo and Smith are totally silent respecting the rate of stretch, and there is simply no teaching in the art that would suggest to one of ordinary skill that Markwood's fast stretching of other thermoplastics could or should be employed in the process of treating PTFE taught by either Sumitomo or Smith. Indeed, Smith not only says nothing about rate of stretch, its preferred teaching is away from other elements of the inventions set forth in claims 3 and 19 Smith discloses that stretching should be done after the PTFE is heated above its crystalline melting point and with decreased crystallinity. Smith teaches:

> Below about 300°C it is *not possible* to draw more than about 4× [times] and while such draw ratios can be attained around 300°C and below the polymer's crystalline melting point with resultant orientation and improved properties it is preferred to use temperatures at or above the polymer's crystalline melting point. (Emphasis added).

Nash teaches that the film should be plasticized, i.e., made more viscous, before stretching. Contrary to that teaching, Dr. Gore did not reduce crystallinity before increasing the rate of stretch, but maintained the unsintered PTFE "highly crystalline" while stretching at a 100% per second rate and to more than five times, as set forth respectively in claims 3 and 19.

On the entire record and in view of all the references, each in its entirety, it is clear that a person of ordinary skill confronted with a PTFE tape breakage problem would have either slowed the rate of stretching or increased the temperature to decrease the crystallinity. Dr. Gore did neither. He proceeded contrary to the accepted wisdom of the prior art by dramatically increasing the rate and length of stretch *and* retaining crystallinity. That fact is strong evidence of nonobviousness. *United States v. Adams*, 383 U.S. 39, 86 S.Ct. 708, 15 L.Ed.2d 572 (1966).

Having learned the details of Dr. Gore's invention, the district court found it within the skill of the art to stretch other material rapidly (Markwood); to stretch PTFE to increase porosity (Sumitomo); and to stretch at high temperatures (Smith). The result is that the claims were used as a frame, and individual, naked parts of separate prior art references were employed as a mosaic to recreate a facsimile of the claimed invention. At no point did the district court, nor does Garlock, explain why that mosaic would have been obvious to one skilled in the art in 1969, or what there was in the prior art that would have caused those skilled in the art to disregard the teachings there found against making just such a mosaic. On the contrary, the references and the uncontested testimony, as above indicated, established that PTFE is *sui generis*. It is not surprising, therefore, that, unlike the situation in *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed.Cir.1983), there was no testimony and no finding that one skilled in the art would transfer conventional thermoplastic

processes to those for unsintered PTFE, or would have been able to predict what would happen if they did.

To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher.

It is difficult but necessary that the decisionmaker forget what he or she has been taught at trial about the claimed invention and cast the mind back to the time the invention was made (often as here many years), to occupy the mind of one skilled in the art who is presented only with the references, and who is normally guided by the then-accepted wisdom in the art. Had that been here done the inventions set forth in the claims 3 and 19 of the '566 patent could only have been held non-obvious to those skilled in the art at the time those claimed inventions were made.

[13, 14] Error in visualizing the burden of proof on obviousness may have contributed to the court's application here of the prior art. Adopting the phrase from earlier precedents, the court said "the presumption [of validity] is weakened greatly where the Patent Office has failed to consider pertinent prior art". That is not the law of established precedent in this court. *SSIH Equipment S.A. v. ITC*, 718 F.2d 365, 218 USPQ 678, 687 (Fed.Cir.1983); *Solder Removal Co. v. ITC*, 582 F.2d 628, 633, 199 USPQ 129, 133, n. 9 (CCPA 1978). The presumption has no separate evidentiary value. It cautions the decisionmaker against a rush to conclude invalidity. Submission of additional art that is merely "pertinent" does not dispel that caution. It is difficult to imagine a patent law suit in which an accused infringer is unable to add some new "pertinent" art. The inescapable burden of persuasion on one who would prove invalidity, however, remains throughout the trial. 35 U.S.C. § 282.

The burden of proving invalidity may of course be facilitated by prior art that is *more pertinent* than that considered by the PTO. That did not happen here. In the present case, Sumitomo, Smith, and the '915 patent were among references considered by the PTO. Other references referred to as not considered were merely cumulative, disclosing nothing not disclosed in references that were considered by the PTO. The Canadian counterpart of Nash was considered by the PTO. The relevant disclosures of Markwood appear in Sandiford patent 3,544,671 and Paratheon patent 3,637,906, both considered by the PTO. The Russian Author's Certificate 240,997, assuming its status as prior art and whatever the material with which it dealt, contributed nothing beyond the teachings of the '915 patent considered by the PTO.

[15] As discussed more fully below, the district court erred in specifically declining to consider the objective evidence of nonobviousness. *In re Sernaker*, 702 F.2d 989, 996, 217 USPQ 1, 7 (Fed.Cir.1983). That evidence can often serve as insurance against the insidious attraction of the siren hindsight when confronted with a difficult task of evaluating the prior art. Though the prior art evidence here pointed more in the direction of nonobviousness than obviousness, the objective evidence may tend, as it did in *Sernaker, supra*, to reassure the decisionmaker.

[16] In sum, the district court erred as a matter of law on this record in concluding that Garlock had met its burden of proving that the inventions of claims 3 and 19 of the '566 patent would have been obvious.

(b) *'390 patent*

(i) *§ 102*

The district court found product claims 1, 9, 12, 14, 18 and 43 inherently anticipated because it found that the microstructure of nodes interconnected by fibrils is an inherent characteristic of paste-extruded PTFE products resulting from the process disclosed in Smith. The court found the first four of those claims and claim 43, plus claims 35, 36, 67 and 77 inherently anticipa-

ted because high strength PTFE products are inherent in the examples of Sumitomo.

The teachings of Smith include neither a disclosure nor a suggestion of "porous" products having a "microstructure characterized by nodes interconnected by fibrils" as required by the claims found to have been anticipated by Smith.

The teachings of Sumitomo do not include a disclosure of products having "a matrix tensile strength ... above about 7,300 psi" as required by the claims found to have been anticipated by Sumitomo.

[17] Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration. *Soundscriber Corp. v. U.S.*, 360 F.2d 954, 960, 148 USPQ 298, 301, *adopted*, 149 USPQ 640 (Ct.Cl.1966). Neither Smith nor Sumitomo disclose an invention set forth in any claim of the '390 patent.

The incongruity in findings that the different processes of Smith and Sumitomo each inherently produced identical products is striking.

Garlock attempted with expert testimony to overcome the prior art shortcomings as proof of anticipation. Gore rebutted with its own expert testimony. It is unnecessary, however, to resolve apparent conflicts in the divergent testimony, much if not all of which took the form of pure unsupported assertion. No inter partes tests in which the Smith and Sumitomo processes were conducted are of record. No products of those processes were placed in evidence, and there was, of course, no analysis of any such evidentiary products.

Nor is it necessary to evaluate the inappropriate disparagement in Garlock's brief of Dr. Sperati as a "friend" of Gore.

[18] Given the unique nature of unsintered PTFE, we are not persuaded that the "effect" of the processes disclosed in Smith and Sumitomo, an "effect" undisclosed in those patents, would be always to inherently produce or be seen always to produce products meeting all of the claim limitations. Anticipation of inventions set forth in product claims cannot be predicated on mere conjecture respecting the characteristics of products that might result from the practice of processes disclosed in references. *In re Felton*, 484 F.2d 495, 500, 179 USPQ 295, 298 (CCPA 1973). It is clear that the teachings of neither Smith nor Sumitomo place the products claimed in the '390 patent in possession of the public.

[19] The teachings of Smith and Sumitomo are so unacceptably vague concerning characteristics of products produced by their respective processes as not to support an anticipation rejection. That fact is confirmed by the PTO's having fully considered those references and by its having issued the '390 patent over them.

[20, 21] Garlock's assertion that it employs a process covered by the Smith patent, if true, is irrelevant. The '390 patent was allowed over Smith as a reference. Assuming Smith a dominating patent, the rule of law is clear that an accused infringer's employment of the process of a dominating patent does not render that employment an anticipation of an invention described and claimed in an improvement patent. As indicated, there is no present record basis for finding that the Smith process in itself necessarily and inherently results in the products, each considered in its entirety, in the claims of the '390 patent. The testimony of Garlock's expert about ex parte tests, the records of which he destroyed before trial, cannot serve as such a basis. The effusive praise of Dr. Gore's claimed products by the owner of the Smith patented process would appear, on the contrary, to confirm the action of the PTO in issuing the '390 patent.

[22] Garlock has not met its burden of showing that claims 1, 9, 12, 14, 18, and 43 are anticipated by Smith or that claims 1, 9, 12, 14, 35, 36, 43, 67, and 77 are anticipated by Sumitomo.

(ii) *§ 103*

[23, 24] The scope and content of the prior art and level of ordinary skill, discussed above in relation to the '566 patent,

would be the same for the '390 patent. The district court did not, however, nor does Garlock, apply the *Graham* criteria, *supra*, to the '390 claims, apparently assuming that the claimed products, having been found inherent in the processes of Sumitomo and Smith, would have been obvious in view of those references. If so, that was error. Inherency and obviousness are distinct concepts. *In re Spormann*, 363 F.2d 444, 448, 150 USPQ 449, 452 (CCPA 1966).

In discussing inherency the district court did recognize differences between Smith's disclosure and the inventions set forth in claims 1, 9, 12, 14, 18, and 43, i.e., the absence from Smith of a description of the products of Smith's process as porous and the absence from Smith of a disclosure that those products have a microstructure characterized by nodes interconnected by fibrils.

Similarly, a difference between Sumitomo's disclosure and the inventions set forth in claims 1, 9, 12, 14, 35, 36, 43, 67, and 77 was recognized in the absence from Sumitomo of a quantification of the matrix tensile strengths of the products of Sumitomo's process. The district court also discussed differences between the dependent claims and the prior art. Because we conclude that the independent claims of the '390 patent are patentable over the art of record, we need not discuss the dependent claims.

[25] Having determined that the invention would have been obvious in view of the process of either Smith or Sumitomo, the district court did not discuss the strong showing of objective evidence of nonobviousness here present, saying with respect to one part of such evidence, "no amount of commercial success can save it." That approach was error. All evidence bearing on the issue of obviousness, as with any other issue raised in the conduct of the judicial process, must be considered and evaluated *before* the required legal conclusion is reached. *Stratoflex, supra*, 713 F.2d 1530, 218 USPQ at 879.

[26] The objective evidence of nonobviousness, i.e., the "indicia" of *Graham, supra*, may in a given case be entitled to more weight or less, depending on its nature and its relationship to the merits of the invention. It may be the most pertinent, probative, and revealing evidence available to aid in reaching a conclusion on the obvious/nonobvious issue. It should when present always be considered as an integral part of the analysis.

Gore's fabric laminates, for example, as set forth in claims 36 and 77, satisfied a long felt need for a material having the contradictory properties of being simultaneously breathable (allowing water vapor or perspiration to pass) and waterproof. The record establishes that such a material had long been sought by makers of rainwear and outerwear, and by the U.S. Army as well. That Gore's fabric laminates filled that need is attested by the rise in their annual dollar sales from zero to seven million in the first five years of their availability.

Gore's PTFE tubes for replacement of human arteries and veins, also satisfied a long felt need. The uncontradicted evidence establishes that Gore's PTFE tubes hold blood without leaking, need not be pre-clotted with the patient's blood, are chemically inert, and, being breathable, are less likely to cause an air embolism. The value and uniqueness of those four properties make Gore's PTFE tubes, as described in unchallenged testimony, "the most important synthetic material presently existing" in vascular surgery, and, along with other evidence in the record, reflect the intended working of the patent system.

As discussed above, current annual sales of over sixty million dollars are attributable to the merits of the products claimed in the '390 patent. Considering the long felt need for those products and the obvious commercial advantage to be gained by meeting that need, it is reasonable to conclude that the claimed products of the '390 patent would not have been obvious to persons of ordinary skill in the art at the time the claimed inventions were made.

As above indicated, the praise which greeted the products claimed in the '390 patent from PTFE suppliers, including the

owner of the Smith patent, is further objective evidence of nonobviousness.

[27] Garlock's appeal argument that the '390 claims are invalid because the recited minimum matrix tensile strengths are not "critical" is without merit. A claim to a new product is not legally required to include critical limitations. *In re Miller,* 441 F.2d 689, 696, 169 USPQ 597, 602 (CCPA 1971). The '390 claims are not drawn to optimization of ingredients or ranges within broad prior art teachings, but to new porous PTFE products of particular characteristics.

[28] In sum, and in view of the difficulty of working with unsintered PTFE and its unpredictable response to various processing techniques, the vagueness of Smith and Sumitomo concerning the products produced by those processes, the filling of at least two long felt needs and the commercial success described above, we conclude that the inventions set forth in claims 1, 9, 12, 14, 18, 35, 36, 43, 67, and 77 of the '390 patent would not have been obvious to those skilled in the art at the time those inventions were made.

(c) *§ 112 and the '566 and '390 patents*

The patents in suit resulted from a single application and thus have substantially identical specifications. The holding of invalidity on the basis of § 112 is common to both patents.

The district court found that the patents did not disclose sufficient information to enable a person of ordinary skill in the art to make and use the invention, as required by § 112, first paragraph, and that certain claim language was indefinite, presumably in light of § 112, second paragraph, because: (1) there was no definition in the specification of "stretch rate", different formulae for computing stretch rate having been developed and presented at trial; (2) there was no way taught in the specification to calculate the minimum rate of stretch above 35°C; (3) the phrase "matrix tensile strength" is indefinite; and (4) the phrase "specific gravity of the solid polymer" is indefinite.

[29, 30] The findings rest on a misinterpretation of § 112, its function and purpose. The district court considered whether certain terms would have been enabling to the public and looked to formula developments and publications occurring well after Dr. Gore's filing date in reaching its conclusions under § 112. Patents, however, are written to enable those skilled in the art to practice the invention, not the public, *In re Storrs,* 245 F.2d 474, 478, 114 USPQ 293, 296–97 (CCPA 1957), and § 112 speaks as of the application filing date, not as of the time of trial. *In re Mott,* 539 F.2d 1291, 1296, 190 USPQ 536, 541 (CCPA 1976). There was no evidence and no finding that those skilled in the art would have found the specification non-enabling or the claim language indefinite on May 21, 1970, when the application which resulted in issuance of Dr. Gore's patents was filed. Indeed, the expert quoted by the district court and whose testimony was primarily relied upon respecting formulae, was still in school at that time.

[31] There is uncontradicted evidence in the record that at the time the application was filed "stretch rate" meant to those skilled in the art the percent of stretch divided by the time of stretching, and that the latter was measurable, for example, with a stopwatch. Concern for the absence from the specification of a formula for calculating stretch rate is therefore misplaced, and the post-filing date development of varying formulae, including Dr. Gore's later addition of a formula in his corresponding Japanese patent, is irrelevant.

[32] Section 112 requires that the inventor set forth the best mode of practicing the invention known to him at the time the application was filed. Calculating stretch rate at that time was accomplished by actually measuring the time required to stretch the PTFE material. That was the only mode then used by the inventor, and it worked. The record establishes that calculation by that mode would have been em-

ployed by those of ordinary skill in the art at the time the application was filed. As indicated, Dr. Gore's disclosure must be examined for § 112 compliance in light of knowledge extant in the art on his application filing date.

[33] The district court, though discussing enablement, spoke also of indefiniteness of "stretch rate", a matter having to do with § 112, second paragraph, and relevant in assessment of infringement. The use of "stretching ... at a rate exceeding about 10% per second" in the claims is not indefinite. Infringement is clearly assessable through use of a stopwatch. No witness said that could not be done. As above indicated, subsequently developed and therefore irrelevant formulae cannot be used to render non-enabling or indefinite that which was enabling and definite at the time the application was filed.

[34, 35] Similarly, absence from the specification of a method for calculating the minimum rate of stretch above 35°C does not render the specification non-enabling. The specification discloses that "[t]he lower limit of expansion rates interact with temperature in a roughly logarithmic fashion, being much higher at higher temperatures." Calculation of minimum stretch rate above 35°C is nowhere in the claims, and it is the *claimed* invention for which enablement is required. The claims require stretching at a rate greater than 10% per second at temperatures between 35°C and the crystalline melt point of unsintered PTFE. That the minimum rate of stretch may increase with temperature does not render non-enabling Dr. Gore's specification, particularly in the absence of convincing evidence that those skilled in the art would have found it non-enabling at the time the application was filed.

[36–38] The district court invalidated both patents for indefiniteness because of its view that some "trial and error" would be needed to determine the "lower limits" of stretch rate above 10% per second at various temperatures above 35°C. That was error. Assuming some experimentation were needed, a patent is not invalid because of a need for experimentation. *Minerals Separation, Ltd. v. Hyde*, 242 U.S. 261, 270–71, 37 S.Ct. 82, 86, 61 L.Ed. 286 (1916). A patent is invalid only when those skilled in the art are required to engage in *undue* experimentation to practice the invention. *In re Angstadt*, 537 F.2d 498, 503–04, 190 USPQ 214, 218 (CCPA 1976). There was no evidence and the court made no finding that undue experimentation was required.

[39] Moreover, the finding here rested on confusion of the role of the specification with that of the claims. The court found that the specification's failure to state the lower limit of stretch rate (albeit above 10% per second) at each degree of temperature above 35°C (a requirement for at least hundreds of entries in the specification) did not "distinguish processes performed above the 'lower limit' from those performed below the 'lower limit' ". The claims of the '390 patent say nothing of processes and lower limits. Distinguishing what infringes from what doesn't is the role of the claims, not of the specification. It is clear that the specification is enabling, *In re Storrs, supra*, and that the claims of both patents are precise within the requirements of the law. *In re Moore*, 439 F.2d 1232, 169 USPQ 236 (CCPA 1971).

[40, 41] The finding that "matrix tensile strength" is indefinite, like the other findings under § 112, appears to rest on a confusion concerning the roles of the claims and the specification. While finding "matrix tensile strength" in the claims indefinite, the district court at the same time recognized that the specification itself disclosed how to compute matrix tensile strength, in stating "to compute matrix tensile strength of a porous specimen, one divides the maximum force required to break the sample by the cross sectional area of the porous sample, and then multiplies this quantity by the ratio of the specific gravity of the solid polymer divided by the specific gravity of the porous specimen." Further, the specification provided the actual matrix tensile strength in several ex-

amples. It is well settled that a patent applicant may be his own lexicographer. In light of the disclosure of its calculation in the specification, we cannot agree that "matrix tensile strength" is either indefinite or non-enabling.

[42] Nor does absence from the specification of a definition for "specific gravity of the solid polymer", a part of the computation of matrix tensile strength, render that computation indefinite. It is undisputed that in the many examples in the application the specific gravity values used for unsintered and sintered PTFE were 2.3 and 2.2, respectively. There was no testimony that those values were not known to persons of ordinary skill in the art or could not be calculated or measured. There is simply no support for the conclusion that "specific gravity of the solid polymer" is indefinite or that absence of its definition renders the specification non-enabling. *See In re Wertheim,* 541 F.2d 257, 191 USPQ 90 (CCPA 1976).

We conclude that Garlock has failed to prove that at the time the application was filed, the specification was not enabling or that the claims were indefinite within the meaning of § 112.

(2) *Fraud*

[43] Fraud must be shown by clear and convincing evidence. *Norton v. Curtiss,* 433 F.2d 779, 797, 167 USPQ 532, 546–47 (CCPA 1970).

> The state of mind of the one making the representations is probably the most important of the elements to be considered in determining the existence of "fraud." . . . Good faith and subjective intent, while they are to be considered, should not *necessarily* be made controlling. Under ordinary circumstances, the *fact* of misrepresentation coupled with proof that the party making it had knowledge of its falsity is enough to warrant drawing the inference that there was a fraudulent intent. Where public policy demands a complete and accurate disclosure it may suffice to show nothing more than that the misrepresentations were made in an atmosphere of gross negligence as to their truth. [emphasis in original].

Norton, 433 F.2d at 795–96, 167 USPQ at 545; *see,* Miller, *Fraud on the PTO,* 58 JPOS 271 (1976).

[44] Garlock alleges fraud in Gore's representations that stretching PTFE tape at a rate greater than 10% per second was novel and that it produces a physical phenomenon. The district court found the evidence insufficient to establish that Gore had a specific intent to defraud the PTO. No basis exists for our overturning that finding. Accordingly, we agree with the district court that Garlock has failed to sustain its heavy burden of proving, by clear and convincing evidence, sufficient facts from which fraudulent intent can be inferred.

Garlock points to a September 4, 1975 Gore affidavit filed in the PTO that stated:

> 2. Prior to my invention disclosed in the captioned patent application, during production of expanded PTFE products by W.L. Gore & Associates, Inc., the rate of stretching was neither measured nor controlled and to my knowledge did *not* involve stretching of unsintered PTFE at a rate exceeding about 10% per second. (emphasis in original)

No finding of the district court and no evidence of record establishes that that statement was made in reckless disregard of facts from which an intent to defraud may be inferred.

[45] The district court's finding in 1982 that the 401 machine inherently stretched tape at some time in 1969 at a rate more than 10% per second, does not establish that Dr. Gore was aware of that fact in 1975, nor does it make untrue his statement that to his knowledge that had not been the rate of stretch employed. Nor does the district court's finding conflict with Dr. Gore's statement that the rate of stretching was neither measured nor controlled in the Gore shop before his invention of the claimed process as a whole.

[46] Nor does the evidence of isolated statements support Garlock's contention

that Dr. Gore attempted to convince the PTO that a physical phenomenon always existed in which stretching at a rate greater than 10% per second always produced a matrix tensile strength greater than 7300 psi. On the contrary, Dr. Gore set forth in his specification examples indicating that some samples broke, ruptured, or disintegrated.

(3) *Attorney's Fees*

[47] The district court did not abuse its discretion in denying Garlock its request for attorney fees.

Infringement

[48] Where, as here, an appellate court reverses a holding of invalidity, and remand is ordered for trial of the factual issue of infringement, an inefficient use of judicial resources results if the second judgment is appealed. The better practice would therefore be for the district court to decide both the validity and infringement issues when both are contested at the trial, enabling the conduct of a single appeal and disposition of the entire case in a single appellate opinion.

Resolution of the infringement issue at trial may also overlap with resolution of the validity issue, where, for example, the claimed invention was or was not copied by the validity challenger, or the challenger substituted the claimed invention for freely available prior art processes or products, *Eibel Process Co. v. Minnesota & Ontario Paper Co.*, 261 U.S. 45, 56, 43 S.Ct. 322, 325, 67 L.Ed. 523 (1923), or an assertion of nonenablement may conflict with the ease with which the accused infringer may be shown to have practiced the invention as taught in the patent. *Eibel, supra*, 261 U.S. at 65–66, 43 S.Ct. at 329.

The district court having declined to decide the infringement issue, Gore suggests that the record here is sufficient to warrant our deciding it now. With reluctance in view of the length and bitter nature of the present litigation, we decline the suggestion. In so doing, we imply nothing of our view on the issue. Nor do we intend any implication that the district court could not itself determine the infringement issue on the present record. Infringement of particular claims of two patents was asserted. None of those claims has been finally held invalid. Assuming their continued assertion, infringement must be decided with respect to each asserted claim as a separate entity. *Altoona, supra*, 294 U.S. at 487, 55 S.Ct. at 459. Those factual determinations should be made in the first instance by the district court.

Decision

The holdings of invalidity of claim 1 of the '566 patent under § 102(a) and of claim 17 of the '566 patent under § 103, the determination that Gore did not commit fraud on the PTO, and the denial of attorney fees, are affirmed; the holdings that all claims of the '566 patent are invalid under § 102(b), that claims 3 and 19 of the '566 patent are invalid under § 103, and that all claims of the '566 patent are invalid under § 112, are reversed. The holdings that claims 1, 9, 12, 14, 18, 35, 36, 43, 67, and 77 of the '390 patent are invalid under §§ 102 and 103, and that all claims of the '390 patent are invalid under § 112, are reversed. The case is remanded for determination of the infringement issue.

AFFIRMED IN PART, REVERSED IN PART, AND REMANDED.

Appendix

Claims of the '566 patent discussed at trial:

1. A process for the production of a porous article of manufacture of a polymer of tetrafluoroethylene which process comprises expanding a shaped article consisting essentially of highly crystalline poly (tetrafluoroethylene) made by a paste-forming extrusion technique, after removal of lubricant, by stretching said unsintered shaped article at a rate exceeding about 10% per second and maintaining said shaped article at a temperature between about 35°C. and the crystalline melt point of said tetrafluoroethylene polymer during said stretching.

Appendix—Continued

3. The process of claim 1 in which the rate of stretch is about 100% per second.

17. The process of claim 1 in which the shaped article is expanded such that its final length in the direction of expansion is greater than about twice the original length.

19. The process of claim 17 in which said final length is greater than about five times the original length.

Claims of the '390 patent discussed at trial:

1. A porous material consisting essentially of highly crystalline polytetrafluoroethylene polymer, which material has a microstructure characterized by nodes interconnected by fibrils and has a matrix tensile strength in at least one direction above about 73,00 psi.

9. A porous material consisting essentially of polytetrafluoroethylene polymer, which material has a microstructure characterized by nodes interconnected by fibrils and has a matrix tensile strength in at least one direction above 9290 psi, which material has been heated to a temperature above the crystalline melt point of said polymer and has a crystallinity below about 95%.

12. A porous material in accordance with claim 9 which is in the form of a shaped article.

14. A product in accordance with claim 12 which is in the form of a film.

18. A product in accordance with claim 12 which is in the form of continuous filaments.

35. A laminated structure comprising (a) a first shaped article formed of a porous material made of a tetrafluoroethylene polymer, which material has a microstructure characterized by nodes interconnected by fibrils and has a matrix tensile strength in at least one direction above about 7,300 psi, and (b) a second shaped article bonded to said first shaped article.

36. The structure of claim 35 in which said first shaped article is formed of a porous material which has a matrix tensile strength in at least one direction of at least 9290 psi, and has a crystallinity below about 95%.

43. A porous material made of a tetrafluoroethylene polymer, which material has a microstructure characterized by nodes interconnected by fibrils, which material (a) has a matrix tensile strength in at least one direction above about 9290 psi, (b) has been heated to a temperature above 327°C. and has a crystallinity below about 95%, and (c) has a dielectric constant of 1.2–1.8.

67. An impregnated structure comprising

(a) a shaped article formed of a porous material made of a tetrafluoroethylene polymer which material has a microstructure characterized by nodes interconnected by fibrils and a matrix tensile strength in at least one direction above about 9290 psi, and

(b) a polymer impregnated within the pores of the said shaped article.

77. The structure of claim 35 in which the first shaped article is a sheet having pores that will pass a gas but will not pass liquid water.

DAVIS, Circuit Judge, concurring in the result in part and dissenting in part.

I concur in the result on (1) the validity of the '390 patent under §§ 102–103; (2) the validity of the '390 patent under § 112; (3) the invalidity of claims 1 and 17 of the '566 patent; (4) lack of fraud on the Patent and Trademark Office; and (5) denial of attorney's fees. I disagree and dissent as to the validity of claims 3 and 19 of the '566 patent.

1. The process invention embodied in claim 1 of the '566 patent was known, through use of the 401 machine in the Gore shop, well before the "invention date" (claimed by Robert Gore, the inventor) of October 1969.[1] As such, the claimed invention was invalid on at least three grounds: (i) it was anticipated and therefore would

1. The 401 machine was used under the prior '915 patent (issued to Wilbert Gore) which contains no reference to the significance of the rate of stretch.

have been obvious (under 35 U.S.C. § 103) at the time of the claimed invention date; (ii) the invention was "in public use" by the Gore shop (under 35 U.S.C. § 102(b)) more than one year prior to the patent application (*i.e.*, prior to May 21, 1969); and (iii) the invention (made by Robert Gore) was known to and used "by others in this country" (35 U.S.C. § 102(a)) before the claimed invention date of October 1969, *i.e.* the invention was used by Wilbert Gore and others in the Gore shop before the October date.[2]

The critically important aspect of the invention of the '566 patent is the stretching of PTFE at a rate above 10% per second.[3] Robert Gore testified that he conceived this invention no earlier than October 1969 (and we have the right to take him at his word),[4] but the facts found by the District Court plainly show that the Gore shop was in fact practicing that invention considerably earlier.

The District Court found that in the 401 machine the distance between the stretch rollers controls the rate of stretch; a shorter distance results in a higher rate of stretch; for the process described in the '915 patent to be practiced with a rate of stretch *below* 10% per second, the distance between the stretch rollers would have to be greater than five feet; if the distance is less than four feet, the rate of stretch is greater than 10% per second; the machine drawings used to construct the 401 machine indicate that the distance between the stretch rollers was eight *inches;* a Gore employee testified that "I am reasonably sure that no effective [stretch] rolls in question would have been more than three feet simply because of the nature and size of the equipment" and that he did not remember any stretching more than three feet; another Gore employee testified that the distance between the rollers was "a maximum of 18 *inches*" (emphasis added); a document prepared by the same employee (an engineer) on June 10, 1969 reports that the stretch span was 8 *inches;* the 401 machine was the only stretching machine used by the Gore company; and the 401 machine was never substantially changed before October 1969. All this adds up to the fact that the 401 machine was at all relevant times operated with a stretch of less than four feet.[5] There is no question that the machine was so operated before October 1969 (the District Court found that sales of tape made by the 401 machine were proposed in August 1969).

I can accept Robert Gore's affidavit (to the PTO) that there was no stretching in the Gore shop at a rate exceeding about 10% per second prior to "*my* invention disclosed in the captioned patent application" (emphasis added)[6] only because that declaration was expressly qualified by the phrase "to *my* knowledge" (emphasis added). The District Court specifically found no specific intent by Robert Gore to defraud and, on this record, we cannot properly overturn that finding. But the absence of personal intent to defraud does not mean or say that, whether Robert Gore realized it or not, the 401 machine was not actually operating, well before October 1969, to stretch unsin-

2. Aside from the bases I discuss, I do not reach the other grounds asserted for invalidity of the '566 patent.

3. Before the PTO Robert Gore concededly referred to this as "critical" to his invention or as *his* "invention."

4. The District Court found that October 1969 was the earliest date Robert Gore asserts for his conception of the invention in the '566 patent.

5. The Gores (Robert and Wilbert) testified at trial that the distance was five feet but there is no indication that the trial court (which did not cite this testimony but did cite the opposing evidence) credited the Gores' testimony.

6. The factor of the rate of stretching was of direct interest to the examiner during the prosecution of the '566 patent. In response to the examiner's express request for a declaration that the Gore firm's production of stretched PTFE tape, prior to Robert Gore's invention asserted here, did not involve stretching of unsintered PTFE at a rate exceeding about 10% per second, Robert Gore filed an affidavit in the PTO specifically stating that "*to my knowledge*" (emphasis added) the 401 machine did *not* involve stretching at a rate exceeding about 10% per second.

tered PTFE at a rate exceeding about 10% per second. *Cf. O'Brien v. Westinghouse Electric Corp.*, 293 F.2d 1, 10 (3rd Cir.1961). It seems impossible to me to reconcile Robert Gore's insistence on two facts—that (i) he invented the process in October 1969 and (ii) he had no knowledge prior to October 1969 of stretching PTFE at the critical rate—with the solid facts in the record as to the prior operation of the 401 machine, except on the view that Robert Gore did not realize that he and others in the Gore shop had made his invention previously.

2. It follows that in October 1969 the invention of '566 would have been obvious under § 103 to Robert Gore because the prior practice of the 401 machine constituted prior art. Even if this was not prior art technically within § 102, that statutory provision "is not the *only* source of prior art." *In re Fout*, 675 F.2d 297, 300 (CCPA 1982, emphasis in original). The 401 machine was practiced under the '915 patent (issued to Wilbert Gore) and, whether or not Robert Gore subjectively realized what was happening, he and others in the Gore shop were practicing the invention later embodied in the '566 patent. That was prior art at least as to Robert Gore. *Id.* at 300–01.[7]

3. If it be thought necessary to invoke § 102 directly, in order to show anticipation, the record contains proof that the 401 machine was designed, constructed and used (just as described *supra*) in November and December 1968 and the early months of 1969—more than one year prior to the '566 patent application of May 21, 1970. *See* Jt.App. E 1199—E 1200. Section 102(b) therefore applies. Although commercial production was apparently not actively sought until June 1969, the practicing of the 401 machine prior to May 21, 1969 was "a public use" because the Gore company made "use of the device * * * in the factory in the regular course of business." *Connecticut Valley Enterprises, Inc. v. United States*, 348 F.2d 949, 952, 146 USPQ 404, 406 (Ct.Cl.1965).

4. Also, § 102(a)[8] applies here because Robert Gore was the inventor in the '566 patent and Wilbert Gore and others in the Gore shop were using the 401 machine before October 1969. Wilbert Gore (the inventor in the '915 patent under which the 401 machine was made and used) and the other employees are "others" within § 102(a)—they are not the same as Robert Gore who claimed to be inventor of the process that ripened into the '566 patent.[9] *See also* § 102(f), which would bar Robert Gore if he did not himself invent the subject matter of the '566 patent.[10]

5. The majority sustains the validity of claims 3 and 19 of the '566 patent (the claims also involved in appellant's suit for infringement) which are dependent on invalid claim 1. Because of the invalidity of claim 1 the only possible novelty in claim 3 would be the requirement that the rate of stretch would be about 100% per second, and the possible novelty of claim 19 would be that the final length would be greater than about five times the original length. My position is that both of these added elements, if novel, would have been obvious to persons of ordinary skill in the art.

The defect in the majority's analysis is that it neglects the cardinal fact that the prior art included the 401 machine (discussed *supra*), not merely the earlier patents assessed in the majority opinion. The 401 machine directly involved PTFE itself, not conventional thermoplastic polymers.

7. The District Court has found that there are no differences between claim 1 of the '566 patent and the processes previously used by the Gore firm to produce paste-extruded unsintered PTFE.

8. An invention is anticipated if it "was known or used *by others* in this country * * * * before the invention thereof by the applicant for patent" (emphasis added).

9. It is undisputed that it was Wilbert Gore who initiated the project for the 401 machine and watched over it.

10. The majority's discussion of "secondary considerations," though it is relevant to other aspects of this case, is irrelevant to the issue of anticipation raised by the 401 machine, and hardly persuasive as to the issues of obviousness based on or with respect to the 401 machine.

That machine also directly involved rapid stretching of PTFE at a rate markedly exceeding 10%. With this prior art of the 401 machine before him, an ordinary person skilled in the art would maximize stretch rate, if only to improve the machine's production rate. Cf. *In re Dwyer, Jewell, Johnson, McGrath, & Rubin*, 317 F.2d 203, 207, 137 USPQ 540 (CCPA 1963). Moreover, the very existence and operation of the 401 machine, which stretched PTFE rapidly without breaking, suggests to the skilled person the probability of stretching at even higher rates. Certainly, in the light of the 401 machine, skilled workers would see in at least the prior Markwood, Nash, and Scarlett patents (teaching extensive and rapid stretching of non-PTFE thermoplastics) the suggestion that the method of the 401 machine could also be used for comparable rapid and extensive stretching of PTFE.

6. In sum, I cannot escape the conclusion that—although there was no fraud proved—if the true facts as to the 401 machine had been made known to the PTO (as it requested), the involved claims of the '566 patent should (and probably would) not have been accepted.

MEDTRONIC, INC., and Med-Rel, Inc., Appellants,

v.

CARDIAC PACEMAKERS, INC., Appellee.

Appeal No. 83-820.

United States Court of Appeals, Federal Circuit.

Nov. 23, 1983.

The United States District Court of Minnesota, Edward J. Devitt, J., 555 F.Supp. 1214, held three patents relating to implantable cardiac pacemakers invalid, and not infringed. On appeal, the Court of Appeals, Markey, Chief Judge, held that: (1) claims 1, 8, 10, 11 and 12 of patent No. 3,391,697, relating to an implantable cardiac pacemaker that does not stimulate the heart above a predetermined rate were invalid as obvious; (2) claims 1, 4, 5, 7, 8, 9, 10 and 23 of patent No. 3,833,005, relating to an implantable digital programmable pacemaker were invalid as obvious; and (3) claim 13 of patent No. 3,901,247, relating to an implantable cardiac pacemaker having an easily interpreted indication of battery condition, was invalid as obvious.

Modified and affirmed.

1. Patents ⇐26(1)

There is neither a statutory distinction between "combination patents" and some other, never defined type of patent, nor a reason to treat the conditions for patentability differently with respect to "combination patents."

2. Patents ⇐324.60

Judgment in patent infringement suit was not so influenced by misstatement of law, that courts "should scrutinize combination patent claims with a care proportioned to the difficulty and improbability of finding invention in an assembly of old elements," so as to require reversal.

3. Patents ⇐112.1

Statutory presumption of a patent's validity is not weakened or destroyed where merely pertinent nonconsidered prior art is introduced; rather, offering party is more likely to carry burden of persuasion imposed by statute when art more pertinent than that considered is introduced. 35 U.S.C.A. § 282.

4. Patents ⇐112.1

A court may not merely "recognize" presumption of a patent's validity and then proceed to "satisfy" itself that the invention possesses such characteristics; rather, statute requires that court begin by presuming that invention has characteristics of

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C

United States Court of Customs and Patent Appeals.

In the Matter of the Application of Robert W. GROSE and Edith Marie Flanigen.

Appeal No. 78-573.

Jan. 18, 1979.
Rehearing Denied March 1, 1979.

A decision of the Patent and Trademark Office Board of Appeals sustained the rejection, for obviousness, of claims of an application, serial No. 432,137, for crystalline aluminosilicate and process for preparing same. On appeal, the Court of Customs and Patent Appeals, Markey, Chief Judge, held that there was a failure to establish that the claimed zeolite was a different crystalline material from that of the prior art.

Affirmed.

West Headnotes

[1] Patents ⚿16(1)
291k16(1) Most Cited Cases
(Formerly 291k16, 291k18)

[1] Patents ⚿66(1.12)
291k66(1.12) Most Cited Cases

Anticipation is ultimate in obviousness, and action of Patent and Trademark Office Board of Appeals in affirming rejection for obviousness encompassed question whether applicants' and patent holder's zeolites were different materials. 35 U.S.C.A. §§ 102, 103.

[2] Patents ⚿32
291k32 Most Cited Cases

[2] Patents ⚿36(3)
291k36(3) Most Cited Cases

When Patent and Trademark Office seeks to rely upon chemical theory in establishing prima facie case of obviousness, it must provide evidentiary support for existence and meaning of that theory, and, for example, known structural relationship between adjacent homologs supplies chemical theory upon which prima facie case of obviousness of compound may rest. 35 U.S.C.A. §§ 102, 103.

[3] Patents ⚿66(1.12)
291k66(1.12) Most Cited Cases

Patent and Trademark Office Board of Appeals, having concluded that zeolites were different, was incorrect in its apparent disregard of other factors to be given weight in determining whether subject matter as a whole would have been obvious, i. e., whether prior art suggested particular structure or form of composition as well as suitable methods of obtaining that structure or form. 35 U.S.C.A. §§ 102, 103.

[4] Patents ⚿16.25
291k16.25 Most Cited Cases
(Formerly 291k18)

Claims 1 and 2 of application serial No. 432,137 for crystalline aluminosilicate and process for preparing same were properly rejected for obviousness, in view of failure to establish that claimed zeolite was different crystalline material from that of prior art. 35 U.S.C.A. § 103.

[5] Patents ⚿114.25
291k114.25 Most Cited Cases

Assertions which were not part of record before Patent and Trademark Office Board of Appeals on application for patent could not be considered on appeal to Court of Customs and Patent Appeals.

Patents ⚿328(2)
291k328(2) Most Cited Cases

3,010,789, 3,030,181. Cited as prior art.
***1162** Richard G. Miller, New York City, atty. of

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record, for appellants; James C. Arvantes, Arlington, Va., of counsel.

Joseph F. Nakamura, Washington, D. C., for the Commissioner of Patents; Gerald H. Bjorge, Washington, D. C., of counsel.

Before MARKEY, Chief Judge, and RICH, BALDWIN, LANE, and MILLER, Judges.

MARKEY, Chief Judge.

Appeal from the decision of the Patent and Trademark Office (PTO) Board of Appeals (board) sustaining the rejection under 35 U.S.C. s 103 of claims 1-2 of application serial No. 432,137, filed January 10, 1974, for "Crystalline Aluminosilicate and Process for Preparing Same." We affirm.

The Invention

The invention is directed to a synthetic crystalline aluminosilicate of the molecular sieve or zeolitic type, named "zeolite Upsilon" by appellants. Claims 1 and 2 read:

1. A synthetic crystalline zeolitic molecular sieve having a composition expressed in terms of mole ratios of oxides as follows:

$$0.9 \pm 0.1\ M_{\frac{2}{n}}O : Al_2O_3 : 2.4-3.4\ SiO_2 : 0-4.5\ H_2O,^{[1]}$$

wherein "M" is at least one or a mixture of two or more of hydrogen, ammonium or metal cations having a valence of "n", said zeolitic molecular sieve in its sodium cation form having an X-ray powder diffraction pattern containing at least those d-spacings set forth in Table B.

2. Composition according to claim 1 wherein "M" represents the sodium cation.

Table B is disclosed in the specification:

TABLE B

<<degrees>> d A obs,	Relative Intensity
13.4 +- 0.2	M
9.5 +- 0.2	VS
8.5 +- 0.15	M
5.47 +- 0.1	S
4.23 +- 0.08	S
3.87 +- 0.07	S
3.53 +- 0.06	M
3.30 +- 0.05	M
3.07 +- 0.05	M
2.98 +- 0.05	S
2.86 +- 0.05	S
2.83 +- 0.05	M

W = weak
S = strong
VS = very strong
VW = very weak
M = medium

Table B represents an abbreviated version of the X-ray powder diffraction pattern used by appellants to identify their zeolite Upsilon and distinguish it from other zeolites. A more detailed X-ray diffraction pattern is disclosed in Table A of the specification:

TABLE A

Bragg Angle, 20- Observed	Interplanar Spacing, d (A) Observed	Relative Intensity, 100 I/Io	Relative Intensity

6.59	13.412	17	M
9.34	9.468	100	VS
10.32	8.571	20	M
13.24	6.687	12	W
13.92	6.362	6	VW
14.75	6.006	7	VW
16.17	5.481	27	S
16.85	5.262	5	VW
17.65	5.025	4	VW
18.80	4.720	7	VW
19.30	4.599	7	VW
19.70	4.506	6	VW
21.00	4.230	32	S
21.56	4.122	8	W
21.98	4.044	10	W
22.99	3.868	25	S
23.34	3.811	12	W
24.13	3.688	10	W
25.20	3.534	17	M
25.76	3.458	10	W
26.75	3.332	6	VW
27.08	3.293	17	M
27.53	3.240	12	W
28.73	3.107	5	VW

29.08	3.071	17	M
29.86	2.992	25	S
30.16	2.963	15	M
30.53	2.928	6	VW
31.38	2.851	29	S
31.65	2.827	18	M
33.18	2.700	12	W
33.30	2.690	12	W
34.40	2.607	7	VW

***1163** Measurement of the X-ray powder diffraction pattern is described as follows:

> Standard techniques were employed to obtain the foregoing data. The radiation was the K-alpha doublet of copper, and a Geiger-counter spectrometer with a strip-chart pen recorder was used. The peak heights, I and the positions as a function of 2 times theta ( ), where theta is the Bragg angle, were read from the spectrometer chart. From these the relative intensities, 100 I/I o, where I o is the intensity of the strongest line or peak, and d(obs.), the interplanar spacing in Angstrom units corresponding to the recorded lines were calculated. The particular x-ray technique and/or apparatus employed, the humidity, the temperature, the orientation of the powder crystals and other variables, all of which are well known and understood by those skilled in the art of x-ray crystallography or diffraction, can cause some variation in the intensities and positions of the x-ray lines.

Appellants disclose that zeolite Upsilon is prepared by hydrothermal crystallization from a gel with the following mole ratios of oxides:

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Na sub2 0/Si0 sub2	0.8 - 1.4
Si0 sub2 /A1 sub2 0 sub3	3.0 - 7
H sub2 0/Na sub2 0	32 - 50, preferably about 43

Crystallization is conducted by heating the gel, at 100 o C and atmospheric pressure, until the crystalline product has been obtained. The presence of chromium or iron oxides, in addition to the above reactants, is disclosed as essential to obtaining zeolite Upsilon as the major zeolite product.[FN2] After crystallization, the zeolite crystals are separated by filtration, washed with distilled water until the pH of the effluent is between 9 and 12, and dried at 110 o C.

FN2. For iron-containing reactant mixtures, Fe 20 3 from about 0.5 to 2.5 weight percent, based on the weight of silica, is said to be effective. For chromium-containing reactant mixtures, 0.5 to 1.0 mole of Cr 20 3 per mole of Al 20 3 is described as satisfactory.

Zeolite Upsilon is disclosed as being useful as a desiccant, particularly in drying hydrocarbon gas streams and air streams to be fractionated in the liquid state, and as an absorbent for carbon dioxide.

The Rejection

Claims 1 and 2 were rejected under 35 U.S.C. s 102 or at least 35 U.S.C. s 103 as unpatentable over the single reference patent to Milton, No. 3,030,181, dated April 17, 1962.

***1164** Milton discloses a synthetic crystalline aluminosilicate, called zeolite R, with the following chemical formula:

0.9+- 0.2 Na sub2 O : Al sub2 O sub3 :WSiO sub2 :XH sub2 O

Wherein W = 3.45 - 3.65 and X = 7 when fully hydrated.

Milton's zeolite R has an X-ray powder diffraction pattern substantially like that shown in this table:

TABLE I

X-Ray Diffraction Patterns pf Synthetic Zeolite R SODIUM ZEOLITE R

[d=Interplanar Spacing in A. : I/I Max.=Relative Intensity]

d, A.	100 (I/I max.)
9.51	88
6.97	35
5.75	16
5.61	26
5.10	45
4.75	12
4.37	78
4.13	12
4.02	14
3.92	35
3.80	16
3.63	41
3.48	25
3.34	12
3.21	18
3.13	12
2.95	100
2.89	16
2.80	14
2.71	14
2.66	10
2.62	25
2.53	22
2.39	10
2.14	6
2.10	14
1.93	10
1.89	10
1.82	18
1.76	6
1.73	16
1.69	4

Milton's crystallization process for preparing zeolite R may use a reactant mixture with these mole ratios of oxides:

Na sub2 0/Si0 sub2	0.81 - 1.0
Si0 sub2 /A1 sub2 0 sub3	3 - 4.5
H sub2 0/Na sub2 0	40 - 80

The process conditions are essentially the same as those described by appellants, except that Milton makes no reference to the presence of iron or chromium oxides in the reaction mixture.

The examiner viewed the chemical composition of the claimed zeolite as encompassed by that of Milton's zeolite R. The only arguable chemical difference between the two zeolites, I. e., Milton's minimum Si0 2/Al 20 3 ratio of 3.45 as compared to appellants' maximum Si0 2/Al 20 3 ratio of 3.4, was not found to be a significant distinguishing feature because "the claimed numerical value of '3.4' which is not limited as to the digit in the second decimal place reads on or encompasses Milton's numerical value of '3.45'."

The examiner found the differences between appellants' 12 X-ray diffraction d-spacings and those reported for Milton's zeolite R insufficient to establish that the claimed zeolite has a different crystal structure from zeolite R because, Inter alia, X-ray diffraction data for a given zeolite can vary depending on variable factors. Appellants were invited to submit expert testimony under 37 CFR 1.132, explaining why the d-spacings recited in the claims define a crystal structure different from that of Milton, but no such testimony was submitted.

The Board

The board essentially agreed with the examiner that appellants' and Milton's zeolites are "the same chemically." After analyzing the maximum Si0 2/Al 20 3 ratio of 3.4 in the instant claims and Milton's minimum ratio of 3.45 from the standpoint of significant digits, the board concluded that "the differences, if any, are De minimis and of no significance."

In comparing appellants' and Milton's d-spacings, the board found substantial differences in their values and relative intensity.[FN3] Concluding therefrom that the zeolites are different materials, the board reversed the rejection under 35 U.S.C. s 102.

> FN3. Examiner-in-Chief Sturtevant filed a specially concurring opinion, setting forth her view that using the data in Table B, as opposed to the more complete detailed data of Table A, to define the X-ray diffraction pattern in the claims was an insufficient method of "fingerprinting" appellants' zeolite.

In addressing the question of obviousness, the board noted that the claimed zeolite had been disclosed as useful for only the purposes known in the art for zeolites in general, that no unexpected advantages were evident, ***1165** and that the only distinguishing feature of the claimed zeolite, I. e., the different diffraction pattern, had not been shown to be useful in any manner. Thus, the board affirmed the 35 U.S.C. s 103 rejection, saying:

> The new zeolites are certainly closely related to known zeolites, being chemically identical, and the properties of the new zeolite must be considered in determining its patentability, as in the case of closely related chemical compounds (homologs, isomers, analogs). See In re Papesch, 315 F.2d 381, 137 USPQ 43. Accordingly, consistent with past decisions, we will allow claims to new and unobvious forms which exhibit a significant change in properties, but we will refuse claims to mere novel forms which do not possess significantly different properties. The present case falls in the latter category.

In requesting reconsideration, appellants repeated

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their argument that the claimed zeolites are not prepared by modifying Milton's zeolite but rather by a unique process, requiring the presence of Fe 20 3 or Cr 20 3 in the reactant mixture, and that nothing of record suggests or renders obvious this unique process. In response, the board dismissed the arguments as pertaining to the process for making the zeolites, while the claims are drawn not to the process but to the composition itself.

Issue

The issue is whether the zeolite of claims 1 and 2 would have been obvious to one of ordinary skill in the zeolite art in view of Milton.

OPINION

[1] The board concluded that appellants' zeolite, because it is a different material from Milton's zeolite R, was not anticipated, and therefore reversed the s 102 rejection, citing In re Arkley, 455 F.2d 586, 59 CCPA 804, 172 USPQ 524 (1972), and In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). The board's affirmance of the rejection for obviousness under s 103 encompasses the question of whether appellants' and Milton's zeolites are different materials, however, because anticipation is the ultimate in obviousness. See In re Pearson, 494 F.2d 1399, 1402, 181 USPQ 641, 644 (CCPA 1974); In re Kalm, 378 F.2d 959, 962, 54 CCPA 1466, 1470, 154 USPQ 10, 12 (1967). We review the decision, not the reasoning, of the board. If the record fails to establish a significant difference in the involved zeolites, the board's decision upholding the s 103 rejection must be affirmed.[FN4]

FN4. The present case illustrates the value, in appropriate cases, of adding a s 103 rejection to a rejection under s 102.

The claims define appellants' synthetic zeolite in terms of its chemical composition and in terms of its physical, I. e., crystal, structure. We agree with the board's conclusion that the claimed zeolite and Milton's zeolite R have the same chemical composition, and with the board's analysis in support thereof. Hence discussion of the alleged difference in Si0 2/Al 20 3 molar ratios is unnecessary. The significance of differences in X-ray diffraction data, however, does require consideration.

Appellants have followed the apparently universal practice in this art of "fingerprinting" the crystal structure of their zeolite through a characteristic X-ray powder diffraction pattern. Thus, the first question is whether the pattern recited in appellants' claims defines a crystal structure different from that of Milton.

Comparison of Table B of appellants' claims with Table I of Milton establishes that the X-ray diffraction patterns are very similar. The differences in the values and relative intensities of the d-spacings [FN5] caused the board to conclude that the two zeolites are different materials. On the present record we disagree with that conclusion of the board.

FN5. Appellants' zeolite is claimed as having d-spacings 13.4 and 8.5 of medium relative intensity. Milton's zeolite R is not disclosed as having such d-spacings. Other alleged differences in appellants' zeolite are said to be reflected by d-spacings 5.47 A and 4.23 A.

X-ray powder diffraction data are merely an analytical tool for identifying polycrystalline ***1166** materials according to differences in crystal structure.[FN6] The ultimate question, in ascertaining whether a particular zeolite is a different species from those of like chemical composition, is whether it has the same crystal structure. Appellants are claiming a crystal structure. Thus, we are concerned not with whether there are differences in d-spacing values and relative intensities, but with whether such differences support a conclusion that appellants' and Milton's zeolites have different crystal structures.

FN6. "Polycrystalline" is defined as "1. Pertaining to a material composed of aggregates of individual crystals. 2. Characterized by variously oriented

> crystals." McGraw-Hill Dictionary of Scientific and Technical Terms 1146 (1974). The properties of polycrystalline materials are largely the average of the properties of the individual crystals. Where the single crystals in a composition of matter are not large enough for individual handling, the crystalline properties are identified through powder, rather than single crystal, diffraction data. The polycrystalline nature of zeolites dictates the use of powder diffraction data for distinguishing one zeolite species from another.

Appellants disclosed in their specification, as well known to those skilled in X-ray crystallography, that the apparatus used, the humidity, temperature, orientation of the powder sample, and other variables, can cause variations in the values and relative intensities of d-spacings. Appellants' specification does not, however, disclose the expected magnitude of such variations.

An indication of the possible magnitude of such variations can be found in an earlier Milton patent, also of record, No. 3,010,789, dated November 28, 1961, which states:

> The relative intensities and the positions of the X-ray lines are only slightly different for the various, ion-exchanged forms of zeolite H.[FN7] The patterns show ***1167** substantially all of the same lines, and all meet the requirements of a unit cell of approximately the same size, indicating that the spatial arrangement of silicon, oxygen and aluminum atoms, i. e., the arrangement of the Al0 4 and Si0 4 tetrahedra, are essentially identical in all forms of zeolite H. The appearance of a few minor lines, and the disappearance of others, from one form of zeolite H to another, as well as slight changes in intensities and positions of some of the X-ray lines, may be attributed to the different sizes and numbers of exchangeable cations present in the various forms of the zeolite.

> FN7. The X-ray diffraction data for the various ion-exchanged forms of zeolite H are disclosed as follows:

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[Note: The following TABLE/FORM is too wide to be displayed on one screen. You must print it for a meaningful review of its contents. The table has been divided into multiple pieces with each piece containing information to help you assemble a printout of the table. The information for each piece includes: (1) a three line message preceding the tabular data showing by line # and character # the position of the upper left-hand corner of the piece and the position of the piece within the entire table; and (2) a numeric scale following the tabular data displaying the character positions.]

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****
******** This is piece 1. -- It begins at character 1 of table line 1. ********
****

Table A

K sub2 H		Na sub2 H		(NH4) sub2 H		
d(A.)	100I/I sub(symbol)	d(A.)	100I/I sub(symbol)	d(A.)	100I/I sub(symbol)	d(A.)
13.4	64	----	---	13.2	32	13.4
11.6	100	11.6	28	11.5	25	11.9
10.6	9	----	---	----	---	----
----	---	----	---	----	---	----
9.50	24	9.00	65	9.50	43	9.40
----	---	----	---	----	---	----
----	---	----	---	----	---	----
6.86	62	6.91	35	6.75	61	6.80
6.03	11	----	---	----	---	6.02
5.37	28	5.21	30	5.21	27	5.21
4.74	8	----	---	----	---	----
4.46	9	----	---	----	---	----
4.41	8	4.37	36	----	---	----
4.31	16	4.31	35	4.31	32	4.31
4.19	23	4.15	17	4.19	25	4.15
----	---	----	---	----	---	----
----	---	----	---	4.04	25	----
3.96	48	3.96	22	3.95	39	3.93
3.72	17	3.72	13	----	---	----
----	---	3.45	35	3.42	21	----
3.36	16	3.34	17	----	---	----
3.26	18	----	---	----	---	----
----	---	3.23	22	----	---	----
3.16	25	3.16	26	3.15	29	----
3.14	22	----	---	----	---	3.14
3.00	31	2.99	52	2.98	54	2.96
2.92	94	2.93	100	2.91	100	2.90
----	---	----	---	----	---	----
----	---	----	---	----	---	----
----	---	----	---	2.72	23	----
2.66	17	----	---	----	---	----
2.66	25	----	---	2.66	14	----
2.63	8	2.63	14	----	---	----
2.50	44	2.00	30	2.58	36	2.59
2.55	15	2.52	13	----	---	2.52

2.34	7	----	---	2.33	7	----
2.32	17	----	---	2.31	10	2.32
2.28	60	2.30	13	2.28	29	2.28
2.19	28	2.17	13	2.18	21	2.18
2.10	21	2.00	9	2.00	14	2.09
----	---	----	---	----	---	----
1.90	8	----	---	----	---	1.90
1.85	29	1.84	22	1.54	18	1.84
1.76	7	----	---	----	---	----
1.73	11	----	---	----	---	----
1.71	33	1.72	17	1.71	18	1.71

1...+...10....+...20....+...30....+...40....+...50....+...60....+...70....+

****
******* This is piece 2. -- It begins at character 76 of table line 1. ********
****

MgH		Ce sub2 H sub3		CaH	
100I/I sub(symbol)	d(A.)	100I/I sub(symbol)	d(A.)	100I/I sub(symbol)	d(A.)
12	13.2	13	----	---	13.2
16	11.6	21	----	---	11.6
---	10.8	15	----	---	----
---	10.3	21	----	---	----
28	9.60	27	9.40	80	9.60
---	8.66	21	----	---	----
---	----	---	----	---	8.04
60	6.80	60	----	---	6.91
16	----	---	----	---	6.02
48	5.27	40	5.15	100	5.15
---	----	---	4.67	30	----
---	----	---	----	---	----
---	----	---	----	---	4.41
48	4.31	54	----	---	4.31
20	4.19	29	4.11	55	4.21
---	4.07	25	----	---	4.13
---	----	---	----	---	----
52	3.93	46	3.90	70	3.93
---	----	---	3.78	50	3.69
---	----	---	----	---	----
---	----	---	----	---	3.37
---	----	---	----	---	3.23
---	----	---	----	---	3.25
---	3.16	42	----	---	----
36	----	---	3.14	40	3.12
60	3.00	46	3.06	40	2.98
100	2.92	100	2.92	80	2.94
---	----	---	2.87	90	----
---	----	---	2.81	90	----
---	----	---	----	---	----
---	2.68	21	----	---	----
---	----	---	----	---	2.65
---	----	---	----	---	----
48	2.59	42	2.00	55	2.62
16	----	---	2.51	40	----

---	----	---	----	---	2.36
24	2.32	17	----	---	2.33
60	2.28	50	2.25	30	2.30
24	2.19	25	----	---	2.21
24	2.09	25	----	---	2.10
---	----	---	----	---	2.08
12	1.90	15	----	---	----
32	1.85	29	1.84	30	1.84
---	1.75	13	1.80	30	----
---	----	---	----	---	----
24	1.71	21	1.60	25	1.72

76.....+...90....+....0....+...10....+...20....+...30....+...40....+

```
*******************************************************************************
******* This is piece 3. -- It begins at character 146 of table line 1. *******
*******************************************************************************


--------------
  ZNH
--------------
    100I/I
 sub(symbol)
--------------

      100
       98
      ---
      ---
       84
      ---
       37
       21
        7


      49
      ---
      ---
       26
       23
       42
       35
      ---
       49
       42
      ---
       23
       37
       41
      ---
       23
       89
       75
      ---
      ---
      ---


     ---
       28
      ---
       58
      ---
```

```
        14
        19
        19
        19
        23
        19
       ---
         3
       ---
       ---
        23
--------------
146......+...6
```

The differences in diffraction data disclosed for the various forms of zeolite H are as great as, and in some respects are greater than, the differences between appellants' claimed zeolite and Milton's zeolite R.

Differences between appellants' zeolite and Milton's zeolite R cannot be attributed to a difference in cation form, because the diffraction data for both are those of the fully cationized sodium cation form.

The specification of the Milton '789 patent also speaks, in language similar to that in appellants' specification, of variations in diffraction data to be expected from other sources:

> The particular X-ray technique and/or apparatus employed, the humidity, the temperature, the orientation of the powder crystals, and other variables, all of which are well known and understood to those skilled in the art of X-ray crystallography or diffraction, may also cause some variations in the intensities and positions of the X-ray lines. Thus, the X-ray data given herein to identify zeolite H are not to exclude those materials which, due to some variable mentioned above or otherwise known to those skilled in the art, fail to show all of the tabulated X-ray lines, or show a few extra ones that are permissible to the crystal system of the zeolite, or show a slight change in intensity or shift in position of some of the X-ray lines.

The present record does not support the conclusion that appellants' zeolite and Milton's zeolite R are zeolites having different crystal structures. The admitted permissible variations in the diffraction data of appellants' zeolite would embrace, at least prima facie, the diffraction data disclosed for Milton's zeolite R. Thus, this is not a situation where the difference in diffraction pattern could only be attributed to a difference in crystal structure.

The prima facie case stands unrebutted, appellants having declined the examiner's invitation to submit expert testimony. Appellants assert in their reply brief that "the ultimate proof of a zeolite's identity resides in its X-ray diffraction pattern," and that "all other evidence, including expert testimony, can only be secondary, i. e., a rationalization of the X-ray data." Appellants are correct in stating that ultimate identification of different crystal structures in this art resides in the X-ray diffraction pattern. They incorrectly evaluate the potential significance of evidence directed to the diffraction data itself, such as testimony that the difference in data between appellants' and Milton's zeolites greatly exceeds the magnitude of expected variations in data, and comparative data obtained on the same apparatus under the same conditions.

Though the board's decision must be affirmed, its reasoning with respect to obviousness considerations was incorrect. The board's basis for finding prima facie obviousness was that the involved zeolites were "closely related" in much the same manner that homologs are closely related, I. e., they are structurally obvious one from the other. Citing In re Papesch, supra, the board concluded that the claimed zeolite was not patentable, absent a showing of some properties significantly different from those of Milton's zeolite R.

[2] No reason exists for applying the law relating to structural obviousness of those compounds which are homologs or isomers of each other to this case. When the PTO seeks to rely upon a chemical ***1168** theory, in establishing a prima facie case of obviousness, it must provide evidentiary support for the existence and meaning of that theory. In re Mills, 281 F.2d 218, 223-24, 47 CCPA 1185, 1191, 126 USPQ 513, 517 (1960). The known structural relationship between adjacent homologs, for example, supplies a chemical theory upon which a prima facie case of obviousness of a compound may rest. A zeolite, like those of the instant case, is not a compound which is a homolog or isomer of another, but is a mixture of various compounds related to each other by a particular crystal structure. Moreover, no other chemical theory has been cited as a basis for considering appellants' zeolite as prima facie obvious in view of Milton's zeolite R.

The board's apparent rejection of appellants' argument that the prior art discloses no method for

obtaining the claimed zeolite, on the ground that the claims are drawn to the composition, was incorrect. One of the assumptions underlying a prima facie obviousness rejection based upon a structural relationship between compounds, such as adjacent homologs, is that a method disclosed for producing one would provide those skilled in the art with a method for producing the other. That assumption does not apply, however, to the present case.

Determining whether a chemical composition is prima facie obvious from another may rest on whether differences in structure and properties of the compositions can be accounted for by obvious modifications in the synthesis process or by obvious modifications of one composition to yield the other. If the differences in X-ray diffraction data between the zeolites here involved had indicated an actual difference in crystal structure, the present record would belie a conclusion that such differences resulted from obvious modifications of any prior art synthesis process or from obvious modifications of Milton's zeolite R to yield the claimed zeolite.[FN8]

> FN8. Assuming appellants' zeolite has a different crystal structure from Milton's zeolite R, nothing of record indicates that one skilled in the art would be able to prepare the claimed zeolite by a process employing Cr 20 3 or Fe 20 3, or otherwise.

[3][4] Though nonobviousness of appellants' process for preparing their claimed composition would not be determinative of nonobviousness of the composition, a holding that the composition would have been nonobvious would require that the prior art fail to disclose or render obvious a process for preparing it.

> (I)f the prior art of record fails to disclose or render obvious a method for making a claimed compound, at the time the invention was made, it may not be legally concluded that the compound itself is in the possession of the public. In this context, we say that the absence of a known or obvious process for making the claimed compounds overcomes a presumption that the compounds are obvious * * *.

In re Hoeksema, 399 F.2d 269, 274, 55 CCPA 1493, 1500, 158 USPQ 596, 601 (1968) (footnote omitted). Failure of the prior art to disclose or render obvious a method for making any composition of matter, whether a compound or a mixture of compounds like a zeolite, precludes a conclusion that the composition would have been obvious. Hence the board, having concluded that the involved zeolites were different, was incorrect in its apparent disregard of "other factors which must be given weight in determining whether the subject matter as a whole would have been obvious, namely, whether the prior art suggests the particular structure or form of the * * * composition as well as suitable methods of obtaining that structure or form." In re Cofer, 354 F.2d 664, 668, 53 CCPA 830, 835, 148 USPQ 268, 271 (1966).

Conclusion

The present record having failed to establish that the claimed zeolite is a different crystalline material from that of Milton's zeolite R, the decision of the board sustaining ***1169** the rejection of claims 1 and 2 under 35 U.S.C. s 103 is Affirmed.

AFFIRMED.

On Petition for Rehearing.

PER CURIAM.

In a petition for rehearing, with respect to our decision and opinion of January 18, 1979, appellants assert that the ranges of values for the d-spacings listed in Table B of their specification reflect the magnitude of variations in data expected from differences in apparatus, temperature, humidity, and the like. However, neither the specification nor any Evidence of record equates the Table B ranges of values with the data variations from such sources.

Appellants also assert that their specification tentatively assigns the claimed zeolite to the cubic symmetry class, citing a publication to indicate that Milton's zeolite R is generally considered of rhombohedral or hexagonal symmetry.

[5] Appellants' assertions in support of the petition may point toward a conclusion that the claimed zeolite has a unique crystal structure. Neither

assertion, however, is part of the record produced before the PTO. Hence, neither may be considered on this appeal.

The petition is denied.

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END OF DOCUMENT

49 CCPA

Application of KNAPP-MONARCH COMPANY.

Patent Appeal No. 6726.

United States Court of Customs and Patent Appeals.

Dec. 18, 1961.

Proceeding on application for registration of composite mark consisting of word "sparklet" superimposed on elongated "S" with stylized symbol used like asterisk after letter "t" for electric drink blenders. The Patent Office Serial No. 64,308 denied the application, and the applicant appealed. The Court of Customs and Patent Appeals, Smith, J., held that neither addition of stylized figure of a "sparkle" over last letter nor use of singular form of "sparklet" and of elongated background S entitled applicant to registration on ground that mark was sufficiently different from reference marks "sparklets" for compressed carbonic gas and covered siphons and bulbs or capsules for containing compressed or liquified gas.

Affirmed.

1. Trade Regulation ⇐191

Neither addition of stylized figure of a "sparkle" over last letter nor use of singular form of word "sparklet" and of elongated background "S" entitled applicant to registration of "sparklet" for electric drink blenders on ground that mark was sufficiently different from reference marks "sparklets" for compressed carbonic gas and covered siphons and bulbs or capsules for containing compressed or liquified gas. Lanham Trade-Mark Act § 2(d), 15 U.S.C.A. § 1052(d).

2. Trade Regulation ⇐227

Patent office classification of particular goods is immaterial in determining likelihood of confusion, mistake, or deception of purchasers as to source of origin of goods. Rules of Practice in Trade-Mark Cases, rule 2.85, 15 U.S.C.A. Appendix; Lanham Trade-Mark Act, § 30, 15 U.S.C.A. § 1112.

3. Evidence ⇐20(1)

It is matter of common knowledge that electric drink blenders, compressed carbonic acid gas and covered siphons and bulbs or capsules for containing compressed or liquified gas are used as "bar accessories" and are sold in similar trade channels to same class of purchasers, and trademark trial and appeal board properly took judicial notice that such goods are sold in common trade channels, in absence of evidence to contrary.

4. Evidence ⇐52

Judicial notice permits proof by evidence to be dispensed with where common knowledge supports truth of proposition.

5. Evidence ⇐4

Judicial notice may be taken of facts though they are neither actually notorious nor bound to be judicially known, yet they would be capable of such instant and unquestionable demonstration, if desired, that no party would think of imposing falsity on tribunal in face of intelligent adversary.

6. Evidence ⇐52

Factual matters of which judicial notice is taken can be challenged by production of evidence to contrary.

7. Trade Regulation ⇐227

Finding of trademark trial and appeal board of likelihood of confusion of purchasers if registration of mark were permitted, based on common knowledge, judicially noticed and relied upon by examiner, that goods to which proposed mark would apply and reference goods were sold to same classes of purchasers and in same channels, was conclusive of issue on appeal in absence of evidence that such goods were not sold to same classes of purchasers and in same trade channels.

8. Trade Regulation ⇐224

Even if registration of "sparklet" was prima facie evidence of registrability of same mark for electric drink blenders as against reference goods for which "sparklets" had been registered, that was insufficient to rebut finding of likelihood

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George B. Newitt, Cl
man Lettvin, Chicago,
for appellant.

Clarence W. Moore,
C. (George C. Roeming
C., of counsel), for the
Patents.

Before WORLEY, C
RICH, MARTIN, and
and Judge WILLIAM
RICK.*

SMITH, Judge.

Appellant filed applic
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* United States Senior Distri
Eastern District of Pe
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of confusion of purchasers, based on common knowledge, judicially noticed and relied upon, that electric drink blenders and reference goods were sold to same classes of purchasers and in same trade channels. Lanham Trade-Mark Act § 7(b), 15 U.S.C.A. § 1057(b).

George B. Newitt, Chicago, Ill. (Norman Lettvin, Chicago, Ill., of counsel), for appellant.

Clarence W. Moore, Washington, D. C. (George C. Roeming, Washington, D. C., of counsel), for the Commissioner of Patents.

Before WORLEY, Chief Judge, and RICH, MARTIN, and SMITH, Judges, and Judge WILLIAM H. KIRKPATRICK.*

SMITH, Judge.

Appellant filed application Serial No. 64,308 on December 15, 1958 for registration on the principal register of a composite mark consisting of the word "Sparklet" superimposed upon an elongated "S" with a stylized symbol (which appellant calls a "sparkle") used like an asterisk after the letter "t", thus, "Sparklet *," for electric drink blenders. Registration of the mark was refused because of prior registrations of the mark "Sparklets" for "compressed carbonic acid gas" (Registration No. 30,214) and "Sparklets" for "covered siphons and bulbs or capsules for containing compressed or liquified gas" (Registration No. 318,546).

The sole issue is whether appellant is entitled to register its mark in view of the provisions of section 2(d) of the Trade-Mark Act of 1946 (15 U.S.C. § 1052, 15 U.S.C.A. § 1052). Resolution of this issue requires a determination of whether the mark for which registration is sought so resembles the marks previously registered as to be likely, when applied to the goods of the applicant, to cause confusion or mistake or to deceive purchasers.

Appellant asserts (1) that no confusion or deception of purchasers is likely since the reference marks are different from appellant's mark, and (2) that there is no likelihood of confusion or deception of purchasers since electric drink blenders and the goods of the reference registrations are different.

[1] On appellant's first assertion, we find that appellant's mark is not sufficiently different from the reference marks to prevent the likelihood of confusion or mistake or the deception of purchasers. Neither the addition of the stylized figure of a "sparkle" over the last letter, nor the use of the singular form of the word "sparklet," nor the use of the elongated background "S" avoids the similarities in appearance, sound and meaning of the identical word "Sparklet" found in both reference registrations and in applicant's mark.

[2] Appellant stresses differences in the goods to which its mark and the reference marks are applied and points out that such goods are classified in different Patent Office classifications. However, the marks when used on the goods of the respective parties would indicate to the average purchaser a common source or origin of all goods on which the marks are used. The Patent Office classification of particular goods is immaterial in determining the likelihood of confusion or mistake or deception of purchasers as to source or origin of the goods. Rules of Practice in Trade-Mark Cases, Rule 2.85, 15 U.S.C.A.Appendix; section 30 of the Trade-Mark Act of 1946 (15 U.S.C. § 1112, 15 U.S.C.A. § 1112).

[3] It is a matter of common knowledge that electric drink blenders and the reference registration goods are used as "bar accessories," and are sold in similar trade channels to the same class of purchasers. The Trademark Trial and Appeal Board properly took judicial notice

* United States Senior District Judge for the Eastern District of Pennsylvania, designated to participate in place of Judge O'CONNELL, pursuant to provisions of Section 294(d), Title 28 United States Code.

that such goods are sold in common trade channels. See In re Malcolm, 129 F.2d 529, 29 CCPA 1145.

[4, 5] Judicial notice permits proof by evidence to be dispensed with where common knowledge supports the truth of a proposition.[1] Judicial notice also may be taken of facts "though they are neither actually notorious nor bound to be judicially known, yet they would be capable of such instant and unquestionable demonstration, if desired, that no party would think of imposing a falsity on the tribunal in the face of an intelligent adversary."[2] But a party "is not prevented from disputing the matter by evidence, if he believes it disputable."[3]

[6, 7] Factual matters of which judicial notice is taken can be challenged by production of evidence to the contrary. If, therefore, appellant here wishes to challenge the truth of the matters judicially noted by the examiner and the Trademark Trial and Appeal Board, he must challenge it by presenting evidence to the contrary. The record does not show any such evidence. In the absence of such evidence, the board's finding, based on its judicial notice of the fact that the goods are sold in the same trade channels, is conclusive of the issue here.

[8] Appellant also contends that its Registration No. 669,376 of November 4, 1958, of the composite mark "Sparklet" and design for "bar accessory kits" was improperly ignored by the examiner and the board in refusing the registration here in issue. Appellant asserts that section 7(b) of the Trade-Mark Act of 1946 (15 U.S.C. § 1057(b), 15 U.S.C.A. § 1057(b)) raises a statutory presumption that the registered mark is dissimilar to other registered marks for similar goods. Based upon this assertion, appellant contends that the owner of the registered mark is entitled to the benefit of any reasonable doubt as to the registrability of the same or a closely similar mark upon a subsequent application to register. Even if we accept this contention, it does not help appellant for there is no reasonable doubt in this case. Appellant's Registration No. 669,376, as prima facie evidence under section 7(b) of the Trade-Mark Act of 1946, is insufficient to rebut the finding of likelihood of confusion, mistake or deception of purchasers based on the common knowledge, judicially noticed and relied upon by the examiner, the board and this court, that electric drink blenders and the reference goods are sold to the same classes of purchasers and in the same trade channels.

The decision of the Trademark Trial and Appeal Board is affirmed.

Affirmed.

WORLEY, Chief Judge, concurs in result.

1. Wigmore on Evidence, Third Edition (1940), Vol. IX, Section 2565.

2. Wigmore on Evidence, Third Edition (1940), Vol. IX, Section 2571(3).

3. Wigmore on Evidence, Third Edition (1940), Vol. IX, Section 2567.

In the Matter of Ignati
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No. 71, Dock

United States Co
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Affirmed.

1. Judgment ⇐828(3.5

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2. Judgment ⇐828(3.5

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The Government has failed to offer any convincing rebuttal to the evidence we have mentioned. At oral argument, Government counsel referred to the Commissioners' letters and the Summaries as very "general." We think their import is clear and that, in fact, they are quite specific. We have no doubt that the Commissioners and the Tariff Commission as then constituted would have regarded the present importations to be properly classified as fuel oil or "fuel oil known as gas oil."

[12] At oral argument there was some discussion of the ability of the Bureau of Customs to change its mind with respect to classification. As noted above, the Bureau can make administrative rulings and change rulings within the scope of its authority by following due procedures. Commonwealth has argued that only the Congress can now change the classification of gas oil. We agree not because we would agree with a proposition that an agency can be frozen into one interpretation, but rather because we have considered the contemporaneous construction of certain Acts of Congress in ascertaining the proper meaning of language contained in those acts. We have to our satisfaction determined the intent of Congress with respect to ambiguous language.

We conclude that the Customs Court correctly interpreted the relevant statutory provisions as providing for the classification of the imported gas oil as fuel oil. The decision and the judgment of the Customs Court in No. 5489 is accordingly affirmed.

SUMMARY

The judgment of the Customs Court in Appeal No. 5488 is affirmed. The judgment of the Customs Court in Appeal No. 5489 is affirmed.

Application of Hector Alfons Vanden EYNDE et al.

Patent Appeal No. 8934.

United States Court of Customs and Patent Appeals.

July 19, 1973.

Appeal from a decision of the Patent Office Board of Appeals, Serial No. 471,437, sustaining rejection of claims 16–21 of application for patent as based on a specification which failed to satisfy requirements of specification statute. The Court of Customs and Patent Appeals, Lane, J., held that Board should have permitted evidence which was advanced in rebuttal of Board's newly advanced position, and that specification was not insufficient for failure to teach how to use the pyrazoline-one color couplers.

Case remanded.

1. Patents ⇐101(5)

Statutory requirement of specificity in relation to patent application is fulfilled where one possessed of the knowledge had by one skilled in the art could use the invention given the specification disclosure without undue experimentation. 35 U.S.C.A. § 112.

2. Patents ⇐101(5), 104

A patent applicant may offer evidence, such as patents and publications, to show the knowledge possessed by those skilled in the art and thereby establish that a given specification disclosure is enabling; in such a situation it is the knowledge possessed by those skilled in the art as of the filing date that is of relevance. 35 U.S.C.A. § 112.

3. Patents ⇐101(5), 104

When a patent examiner initially turns to an application he may properly lodge a rejection of a claim as based upon a specification which is not in compliance with specification statute, if it

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appears reasonable to conclude that one skilled in the art would have been unable to use the invention at the time the application was filed, and when that conclusion is reasonable the burden is on the applicant to rebut it if he can. 35 U.S.C.A. § 112.

4. Patents ⇐104

A patent applicant must be permitted to respond to a position assumed by patent examiner or by the Patent Office Board of Appeals, but the response must be timely; if an applicant fails to challenge the examiner's conclusion regarding enablement, or fails to do so in timely fashion, the rejection stands. 35 U.S.C.A. § 112.

5. Patents ⇐104

Evidence submitted by patent applicant in response to a rejection on grounds set forth in specification statute is not timely at any point during prosecution because the examiner or Board of Patent Appeals could have located such evidence; it is the applicant's responsibility to prove in timely fashion that a prima facie reasonable conclusion of nonenablement is in fact unreasonable in view of the state of the art. 35 U.S.C.A. § 112.

6. Evidence ⇐19

Facts constituting the state of the art in a patent case are normally subject to the possibility of rational disagreement among reasonable men, and are not amenable to the taking of judicial or administrative notice.

7. Patents ⇐104

Where Board of Patent Appeals advances a position or rationale new to the proceedings, as it is empowered to do, applicant for patent must be afforded an opportunity to respond to that position or rationale by the submission of contradicting evidence, and refusal of the Board to consider evidence which responds to such a new rationale is error.

8. Patents ⇐104

Position of Board of Patent Appeals as to role of certain reference, consisting of a treatise on photographic chemistry, in establishing state of the art was not itself a new rationale which justified the submission of additional evidence by applicants for patent, where the Board originally decided the appeal on the record before it, and where the certain reference was the only reference material which applicant had offered up to that point, so that Board did not err in refusing to consider later-filed evidence on that issue.

9. Patents ⇐104

Where Patent Office Board of Appeals clearly went off on its own in considering differences between reaction environment set forth in reference of applicants for patent and reaction environment of another patent, and where applicants offered evidence allegedly showing prior art use of the other patent conditions in hydrazine-to-color coupler reactions, applicants might have convinced Board, by demonstrating that both the reference and the patent reaction conditions were known prior to filing, that at time of filing one skilled in the art would not have had reason to doubt the efficacy of the environment set forth in the reference, and Board should not have refused to consider that evidence in rebuttal of Board's newly advanced position.

10. Patents ⇐101(8), 104

Where color couplers were, in general, unquestionably well-known materials, and utility for color couplers per se did not have to be separately established, applicants for patent entitled "Fluoro-Alkylhydrazines and Process for the Preparation Thereof." did not have to demonstrate how to use the color couplers, and Board of Patent Appeals erred to the extent that it agreed with examiner that specification of applicants was insufficient for failure to teach how to use the pyrazoline-one color couplers. 35 U.S.C.A. § 112.

Alfred W. Breiner, Arlington, Va., attorney of record, for appellants.

S. Wm. Cochran, Washington, D. C., for the Commissioner of Patents. Raymond E. Martin, Robert D. Edmonds, Washington, D. C., of counsel.

Before MARKEY, Chief Judge, RICH, BALDWIN and LANE, Judges, and ALMOND, Senior Judge.

LANE, Judge.

This appeal is from the decision of the Patent Office Board of Appeals, adhered to on reconsideration, sustaining the rejection of claims 16–21 of appellants' application [1] as based on a specification which fails to satisfy the requirements of the first paragraph of 35 U.S.C. § 112. We remand this case to the board for the reasons and purposes hereafter set forth. The most difficult aspect of this appeal is the determination of the propriety of the board's refusal to consider certain patents and publications submitted by appellants subsequent to the board's original decision as an accompaniment to a request for reconsideration. To fairly explain the issues before us and our resolution of them, we initially recount the positions of the principals as developed below.

THE PROCEEDINGS BELOW

The Invention

The claims on appeal are all chemical compound claims. Claim 16 defines the genus and reads as follows:

16. A fluoro-alkyl hydrazine corresponding to the following formula:

$$(X\text{-}CF_2)_n\text{-}\underset{R}{CH}\text{-}NH\text{-}NH_2$$

wherein:

X is a member of the group consisting of a hydrogen atom and a fluorine atom,

R is a member of the group consisting of a hydrogen atom, lower alkyl or phenyl, and

n is a positive integer from 1 to 25 inclusive.

The specification characterizes the invention as relating to "new fluoro-alkylhydrazines" and "[m]ore particularly," "a process for the preparation thereof." Indeed the specification for the most part discusses the manner of making the claimed compounds. As for utility, the specification states the following:

> The fluoro-alkyl hydrazines according to the present invention are important starting materials for the synthesis of several organic compounds such as 1-fluoroalkyl-2-pyrazoline-5-one colour couplers, which form magenta azomethine dyes on colour development of exposed light-sensitive silver halide materials with aromatic primary amines.

Proceedings Before The Examiner

That statement of utility was the focus of the examiner's rejection of the claims first under both sections 101 and 112, and later under section 112 alone. The examiner considered the statement "vague and indefinite," and generally regarded it as insufficient to teach one skilled in the art how to use the claimed invention. The examiner questioned the manner in which the claimed hydrazines could be converted to color couplers and the manner in which the so-formed couplers could be used to yield magenta dyes on color development.

Appellants contended that one skilled in the relevant art would have been able to make color couplers from the hydrazines and would have known how to use the couplers in color development. Appellants generally argued that the utility requirements and all disclosure requirements of the patent laws were satisfied.

At one point during prosecution, appellants introduced a page of a treatise on photographic chemistry by Glafkide,[2]

1. Serial No. 471,437 filed July 12, 1965, entitled "Fluoro-Alkylhydrazines and Process for the Preparation Thereof."

2. Glafkide, *Photographic Chemistry*, vol. II, page 601, Fountain Press (London 1960).

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follows:

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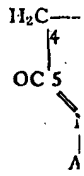

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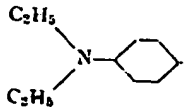

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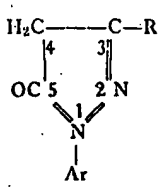


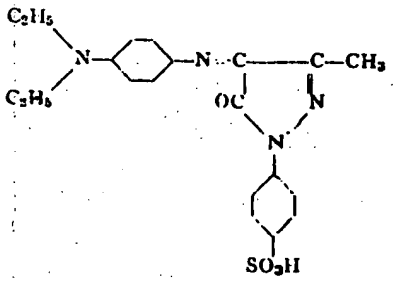
[A7636]

are very widely used for colour films.

* * *

The pyrazolones are prepared by hot condensation of a phenylhydrazine $Ar-NH-NH_2$ with a keto compound such as acetoacetic ester $CH_3-CO-CH_2-CO-O-C_2H_5$ in the presence of water and alcohol. They are insoluble in water, but soluble in caustic soda. Their sulphonated derivatives are soluble.

The simplest coupler is *1–phenyl–3–methyl–5–pyrazolone.* The aryl sulphonated compound is prepared from sulphophenylhydrazine. With diethyl–p–phenylene diamine, a magenta dye is obtained with the formula:



[A7637]

Before coupling, the keto group $-CO-CH_2-$ is isomerized to the enol form–$C(OH)<CH-$.

Appellants stated that:

[Glafkide] teaches the "classical" method of producing magenta color couplers with a pyrazolone structure by means of the hot condensation of a hydrazine with a carbonyl containing compound such as a substituted acetoacetic ester. Thus, the method of converting the fluoroalkyl hydrazine of the present invention to 1–fluoroalkyl–2–pyrazoline–5–one color couplers is well known in the art.

The examiner first commented on Glafkide in his Answer stating:

> The Glafkide publication does disclose the reaction of a *phenylhydrazine* with a keto compound to give a pyrazolone which then couples a primary aromatic amine to give a magenta azomethane compound, but the *instant* hydrazines are not *phenylhydrazines* and there is no assurance that the instant hydrazines would so react or what the reaction conditions would be. [Emphasis in original.]

The examiner continued to hold that the specification disclosure of utility is insufficient, although he limited the basis of the rejection to the first paragraph of § 112.

In a reply brief following the Examiner's Answer, appellants expressly acknowledged the examiner's comment regarding the Glafkide publication. Appellants argued:

> This statement would have greater significance if not for the expressed and implied indication by appellants that the conditions used with a phenylhydrazine when applied to the fluoroalkyl-hydrazines will result in a useful product.

Proceedings Before The Board

The board quoted the statement of utility appearing in appellants' specification and phrased the appellants' position as follows:

> It appears to be appellants' view that, in the light of the Glafkide publication, one having ordinary skill in the art would know how to use the claimed compounds as starting materials to produce the 1–fluoroalkyl–2–pyrazoline–5–one compounds, and furthermore would know how to employ the latter for the suggested purpose in photographic emulsions, all without further disclosure than that quoted above.

The board agreed with the examiner's view of Glafkide stating:

> We note * * * that the starting hydrazines and compounds produced by the Glafkide publication are different from those which would be employed and produced according to appellants' suggestion, in that they have aryl groups in place of the fluoroalkyl groups. We do not find that one skilled in the art would be able to predict with certainty that the fluoroalkyl compounds would react identically and under the same conditions as the aryl compounds of Glafkide, nor is there evidence in the record that they in fact do so.

In support of this conclusion the board made reference to a patent[3] (hereafter the Eynde patent) issued on an application[4] (hereafter the Eynde application) filed by appellants on July 14, 1965, two days subsequent to the filing date of the application involved in this appeal. The Eynde patent discloses in detail the manner of using the fluoroalkyl hydrazines to form color couplers and the use of such couplers in color development.

It was presumably intended that the Eynde application be filed concurrently with the present application, and the present specification as originally filed made express reference to the Eynde application for a disclosure of the preparation of color couplers. However, the Eynde application was filed later for one reason or another, and reference thereto was deleted from the present application. The board was therefore aware of the Eynde patent which matured from the Eynde application and of the fact that appellants contemplated the methods disclosed therein as the means for converting the fluoroalkyl hydrazines to color couplers.

The board held as follows:

> We note that in * * * [the Eynde patent] the conditions actually used are not the same as in the publication. The patent in all cases conducts the reaction in the presence of acetic acid; the reference employs a hot condensation in the presence of water and alcohol. It therefore is not even apparent from the record before us that the claimed compounds can in fact be used in the same manner as the known compounds of Glafkide * * *. Nor do we find that it would have been obvious that the fluoroalkyl pyrazoline–5–one compounds would be usable in the same manner in photographic compositions. * * * At the most, it might appear "obvious to try" the reactions and conditions indicated by the Glafkide publication upon appellants' novel hydrazine compounds, but this does not appear to be the standard by which sufficiency of disclosure under the first paragraph of 35 U.S.C. 112 is determined. We will therefore sustain the rejection for lack of sufficient disclosure of how to use the compounds.

We observe at this point that the examiner had not based his conclusions on the differences between the Eynde patent reaction environment and that disclosed in Glafkide. That was clearly a rationale new to the proceedings. We cannot ascertain the extent to which the board's rationale influenced its affirmance. For example, we do not know whether the board considered it an alternative basis for affirmance or whether the board regarded it is providing essential support to the examiner's reasoning.

Appellants filed a request for reconsideration of the decision of the board accompanied by a number of patent and publication references offered for the purpose of demonstrating the knowledge possessed by those skilled in the art. The board noted that the references were not "urged upon [it] in the brief," and since the references were not of record prior to the board's original decision, the board refused to consider them.

3. U.S. Patent No. 3,462,270 issued August 19, 1969.

4. Serial No. 472,017.

The board adhered to its original decision.

In response to the board's refusal to consider the reference material, appellants contended that the board erred in its assessment of appellants' position, noted above, to the effect that "in the light of the Glafkide publication," one skilled in the art would have known how to use the claimed compounds. Appellants justified the submission of additional reference material as follows:

> Appellants asserted and assert that having the teaching of the specification, *one skilled in the art of photographic chemistry* would be able to employ the invention in light of the disclosure of utility at page 3 of appellants' specification. The Glafkide reference was referred to as being *exemplary* of what was known and available to the *skilled photographic chemist.* It was not intended to be a summary of the only knowledge known and available to the skilled photographic chemist. Appellants, in their Petition for Reconsideration, referred to the numerous other patents and publication[s] to clearly establish the host of art in this area. This is art which was available to the Examiner in the Patent Office and to the Board of Appeals to determine what knowledge was available to a skilled photographic chemist. This art could have been obtained merely by calling an examiner in Group 160, the art unit responsible for examining photographic cases.
>
> An applicant is presumed to have all prior art before him at the time he makes an invention. It is submitted that it is not too much for an applicant to ask that the examiner and the Board of Appeals be held to the same standard, with it being presumed that all the pertinent art was available to the Examiner. [Emphasis in original.]

The Positions of the Parties on Appeal

The solicitor states that the rejection here involved is based on the "how-to-use" requirement of the first paragraph of section 112. It is emphasized to the court that the truth of the assertions that the fluoroalkyl hydrazines can be converted to pyrazoline-one color couplers and that such color couplers function in the manner described in the specification is not here questioned. Rather, the gist of the rejection is said to be that one skilled in the art would not have known how to so utilize the claimed compounds, at least in the absence of probative evidence to the contrary.

The solicitor urges that the board correctly refused to consider the reference material submitted after its decision. He observes that the board agreed with the examiner that Glafkide is insufficient since directed to *phenyl*hydrazines, and he argues that none of the references subsequently filed bears directly on the additional point raised by the board respecting the differences between the Glafkide and Eynde patent reaction environment conditions. The solicitor concludes that the board made no new factual assumptions the rebuttal of which might justify considering additional reference material.

Appellants contend that the claimed compounds have utility and that one skilled in the art would know how to use them given the specification statement of utility. Appellants additionally contend that Glafkide demonstrates the manner in which the claimed compounds can be used. They argue that as a matter of fact, the phenyl portion of the Glafkide structure, like the fluoroalkyl group of their own compound, is not involved in the pyrazoline-one-forming reaction.

Appellants assert that in any event the additional reference material clearly establishes that at the time the present application was filed, the level of skill in the pertinent art was such that the manner of using the compounds would have been apparent. It is appellants' position that a "new rationale" of the board prompted the submission of that material and that In re Moore, 444 F.2d 572, 58 CCPA 1340, 170 USPQ 260 (1971) is authority for the proposition that the

board should have considered it. Alternatively, they ask this court to take judicial notice of those prior patents and publications.

OPINION

The "How-to-Use" Requirement

[1, 2] We accept the solicitor's view that the rejection before us is based solely on the "how-to-use" requirement of § 112. The first paragraph of § 112 requires in pertinent part that:

> The specification shall contain a written description * * * of the manner and process of * * * using * * * [the invention] in such full, clear, concise, and exact terms as to enable any person skilled in the art * * * to * * * use the same * * *.

That statutory requirement is fulfilled where one possessed of the knowledge had by one skilled in the art could use the invention given the specification disclosure without undue experimentation. A patent applicant may offer evidence, such as patents and publications, to show the knowledge possessed by those skilled in the art and thereby establish that a given specification disclosure is enabling. See, e. g., Martin v. Johnson, 454 F.2d 746, 59 CCPA —— (1972). In such a situation, it is the knowledge possessed by those skilled in the art as of the filing date that is of relevance. See Tummers v. Kleimack, 455 F.2d 566, 568, 59 CCPA ——, —— (1972).

[3] When an examiner initially turns to an application, he may properly lodge a rejection of a claim as based upon a specification which is not in compliance with § 112, first paragraph, if it appears reasonable to conclude that one skilled in the art would have been unable to use the invention at the time the application was filed. When that conclusion *is* reasonable, the burden is on to the applicant to rebut it, if he can, such as by offering evidence as discussed above. See, e. g., In re Gardner, 475 F. 2d 1389 (CCPA 1973).

[4] It is clear that an applicant must be permitted to respond to a position assumed by the examiner or the board. However, the response must be timely. If an applicant fails to challenge the examiner's conclusion regarding enablement, or fails to do so timely, the rejection stands.

[5, 6] We reject the contention advanced by appellants that evidence submitted by an applicant in response to a § 112 rejection is timely at any point during prosecution because the examiner or board could have located it. We adhere to the view that it is the applicant's responsibility to prove that a prima facie reasonable conclusion of nonenablement is in fact unreasonable in view of the state of the art. Orderly and logical examining procedure compels that view. Moreover, we reject the notion that judicial or administrative notice may be taken of the state of the art. The facts constituting the state of the art are normally subject to the possibility of rational disagreement among reasonable men and are not amenable to the taking of such notice. If evidence of the knowledge possessed by those skilled in the art is to be properly considered, it must be timely injected into the proceedings.

[7] We do agree with appellants that where the board advances a position or rationale new to the proceedings, as it is empowered to do and quite capable of doing, the appellant must be afforded an opportunity to respond to that position or rationale by the submission of contradicting evidence. This court so held in In re Moore, supra, and we expressly reaffirm that view. The board's refusal to consider evidence which responds to such a new rationale is error.

The Board's Refusal to Consider the Evidence in This Case

Appellants in this case strenuously and primarily asserted that the board misconstrued the import of the submission of the Glafkide reference during prosecution before the examiner. They

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argued that the board treated Glafkide as the only evidence of the state of the art whereas they intended it as merely exemplary of many patents and publications in the field of photographic chemistry. In appellants' view, the position of the board as to the role of Glafkide in establishing the state of the art was itself a new rationale which justified the submission of additional evidence.

Appellants' contention is untenable. The board originally decided the appeal on the record before it. Glafkide was the only reference material which appellants had offered to that point.

[8] In discussing the submitted material in the request for reconsideration, appellants pointed to disclosures which allegedly tend to support the view that those skilled in the art would have considered the reaction of a phenylhydrazine to form a pyrazoline color coupler to be directly applicable to the conversion of a fluoroalkyl hydrazine contrary to the examiner's and board's belief. Appellants were confronted with this argument in the Examiner's Answer and expressly acknowledged it, and attempted to answer it, in a reply brief. If there is evidence to support their position, appellants should have presented it at that point. The board did not raise that issue, and we agree with the solicitor that there is no basis in the board's decision for a justification for the submission of evidence on that issue after the board's decision. The board did not err in refusing to consider the later-filed evidence to that extent.

[9] However, the board clearly went off on its own in considering the differences between the Glafkide reaction environment and the Eynde patent reaction environment. Appellants offered evidence allegedly showing the prior art use of the Eynde patent conditions in hydrazine-to-color coupler reactions. By demonstrating that both the Glafkide and Eynde patent reaction conditions were known prior to filing, appellants might have convinced the board that at the time of filing, one skilled in the art would not have had reason to doubt the efficacy of the Glafkide environment. We disagree with the solicitor's analysis of the evidence offered on this point, and we conclude that the board did commit error in refusing to consider that evidence in rebuttal of the board's newly advanced position.

The Manner of Using the Color Couplers

[10] Thus far in our opinion we have not mentioned the board's findings with respect to the manner of using the color couplers. We agree that in order for the specification to be enabling in the sense of § 112, one skilled in the art would have to have been able to use the claimed hydrazines in the manner asserted in the specification, i. e., as a starting material for the synthesis of color couplers. However, color couplers are, in general, unquestionably well known materials, and utility for color couplers per se need not be separately established. We accordingly see no necessity for appellants to demonstrate how to use the color couplers. Given that the claimed compounds are useful in the manufacture of products having known utility, appellants' specification is sufficient if it enables one skilled in the art to make those products. We accordingly hold that the board was also in error to the extent that it agreed with the examiner that the specification is insufficient for failure to teach how to use the pyrazoline-one color couplers.

The Remand

We have made two findings of error which seriously undermine the decision of the board. We have found that the board erroneously refused to consider evidence allegedly bearing on its new rationale and that it erroneously regarded inquiry into the manner of using products obtained by reaction of the claimed compounds as proper. We remand this case to the board for action not inconsistent with these findings or this opinion in general.

Remanded.

Westlaw.

277 F.3d 1338
61 U.S.P.Q.2d 1430
(Cite as: 277 F.3d 1338)

Briefs and Other Related Documents

United States Court of Appeals,
Federal Circuit.

In re SANG-SU LEE.

No. 00-1158.

Jan. 18, 2002.

Board of Patent Appeals and Interferences rejected all claims of inventor's patent application directed toward method of automatically displaying functions of video display device that demonstrated how to select and adjust functions in order to facilitate response by user. Inventor appealed. The Court of Appeals, Pauline Newman, Circuit Judge, held that analysis by Board did not comport with either legal requirements for determination of obviousness or with requirements of Administrative Procedure Act (APA).

Vacated and remanded.

West Headnotes

[1] Patents ⚿113(6)
291k113(6) Most Cited Cases

Tribunals of the Patent and Trademark Office (PTO) are governed by the Administrative Procedure Act (APA), and their rulings receive the same judicial deference as do tribunals of other administrative agencies. 5 U.S.C.A. § 551 et seq.

[2] Administrative Law and Procedure ⚿485
15Ak485 Most Cited Cases

[2] Administrative Law and Procedure ⚿507
15Ak507 Most Cited Cases

For judicial review to be meaningfully achieved within the strictures of the Administrative Procedures Act (APA), an agency tribunal must present a full and reasoned explanation of its decision; the agency tribunal must set forth its findings and the grounds thereof, as supported by the agency record, and explain its application of the law to the found facts. 5 U.S.C.A. § 706(2).

[3] Patents ⚿113(6)
291k113(6) Most Cited Cases

Judicial review of a decision of the Board of Patent Appeals and Interferences denying an application for a patent is founded on the obligation of the agency to make the necessary findings and to provide an administrative record showing the evidence on which the findings are based, accompanied by the agency's reasoning in reaching its conclusions. 5 U.S.C.A. § 551 et seq.

[4] Patents ⚿31.1
291k31.1 Most Cited Cases

As applied to the determination of patentability vel non when the issue is obviousness, it is fundamental that the rejection of a patent application must be based on evidence comprehended by the language of the statute addressing obviousness. 35 U.S.C.A. § 103.

[5] Patents ⚿16.5(1)
291k16.5(1) Most Cited Cases

The patent examination process centers on prior art and the analysis thereof; when patentability turns on the question of obviousness, the search for and analysis of the prior art includes evidence relevant to the finding of whether there is a teaching, motivation, or suggestion to select and combine the references relied on as evidence of obviousness. 35 U.S.C.A. § 103.

[7] Patents ⚿111
291k111 Most Cited Cases

Analysis of invention by Board of Patent Appeals and Interferences did not comport with either legal requirements for determination of obviousness or with requirements of Administrative Procedure Act (APA) on basis that agency tribunal did not set forth findings and explanations needed for reasoned decisionmaking; examiner used conclusory statements to support his subjective belief that it was obvious that person skilled in the art would have been motivated to combine prior art, and Board rejected need for any specific hint or suggestion in particular reference to support combination of prior art. 5 U.S.C.A. § 706(2); 35 U.S.C.A. § 103.

[9] Patents ⚿111
291k111 Most Cited Cases

In an obviousness determination under patent law, it is improper, in determining whether a person of ordinary skill would have been led to combine references, simply to use that which the inventor taught against its teacher; thus, the Board of Patent Appeals and Interferences must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the agency's conclusion. 5 U.S.C.A. § 706(2); 35 U.S.C.A. § 103.

[10] Administrative Law and Procedure ⚿507
15Ak507 Most Cited Cases

Deferential judicial review under the Administrative Procedure Act (APA) does not relieve the agency of its obligation to develop an evidentiary basis for its findings; to the contrary, the APA reinforces this obligation. 5 U.S.C.A. § 706(2).

[11] Administrative Law and Procedure ⚿763
15Ak763 Most Cited Cases

[11] Administrative Law and Procedure ⚿796
15Ak796 Most Cited Cases

In the context of judicial review under the Administrative Procedure Act (APA), a decision by an agency tribunal that has an omission of a relevant factor required by precedent is both legal error and "arbitrary agency action." 5 U.S.C.A. § 551 et seq.

[12] Administrative Law and Procedure ⚿485
15Ak485 Most Cited Cases

[12] Administrative Law and Procedure ⚿760
15Ak760 Most Cited Cases

The foundation of the principle of judicial deference under the Administrative Procedures Act (APA) to the rulings of agency tribunals is that the tribunal has specialized knowledge and expertise, such that when reasoned findings are made, a reviewing court may confidently defer to the agency's application of its knowledge in its area of expertise; however, reasoned findings are critical to the performance of agency functions and judicial reliance on agency competence. 5 U.S.C.A. § 706(2).

[13] Patents ⚿16(1)
291k16(1) Most Cited Cases

The determination of patentability on the ground of unobviousness is ultimately one of judgment; in furtherance of the judgmental process, the patent examination procedure serves both to find, and to place on the official record, that which has been considered with respect to patentability. 35 U.S.C.A. § 103.

[14] Patents ⚿16(3)
291k16(3) Most Cited Cases

[14] Patents ⚿104
291k104 Most Cited Cases

[14] Patents ⚿111
291k111 Most Cited Cases

In the context of an obviousness determination, the patent examiner and the Board of Patent Appeals and Interferences are deemed to have experience in the field of the invention; however, this experience, insofar as applied to the determination of patentability, must be applied from the viewpoint of the person having ordinary skill in the art to which said subject matter pertains. 35 U.S.C.A. § 103.

[15] Patents ⚿104
291k104 Most Cited Cases

In finding the relevant facts, in assessing the

significance of the prior art, and in making the ultimate determination of the issue of obviousness, the examiner and the Board of Patent Appeals and Interferences are presumed to act from the viewpoint of a person having ordinary skill in the art to which the subject matter pertains; thus, when they rely on what they assert to be general knowledge to negate patentability, that knowledge must be articulated and placed on the record and the failure to do so is not consistent with either effective administrative procedure or effective judicial review. 5 U.S.C.A. § 706(2); 35 U.S.C.A. § 103.

[16] Patents ⚿111
291k111 Most Cited Cases

In the context of an obviousness determination, the Board of Patent Appeals and Interferences cannot rely on conclusory statements when dealing with particular combinations of prior art and specific claims, but must set forth the rationale on which it relies. 5 U.S.C.A. § 706(2); 35 U.S.C.A. § 103.

[17] Administrative Law and Procedure ⚿326
15Ak326 Most Cited Cases

[17] Administrative Law and Procedure ⚿485
15Ak485 Most Cited Cases

[17] Administrative Law and Procedure ⚿507
15Ak507 Most Cited Cases

Sound administrative procedure requires that an agency apply the law in accordance with statute and precedent; the agency tribunal must make findings of relevant facts, and present its reasoning in sufficient detail that the court may conduct meaningful review of the agency action. 5 U.S.C.A. § 706(2).

Patents ⚿328(2)
291k328(2) Most Cited Cases

4,626,892. Cited As Prior Art.
***1340** Richard H. Stern, of Washington, DC, argued for Sang Su Lee. With him on the brief was Robert E. Bushnell.

Sidney O. Johnson, Jr., Associate Solicitor, of Arlington, Virginia, argued for the Director of the U.S. Patent and Trademark Office. With him on the brief were John M. Whealan, Solicitor, and Raymond T. Chen, Associate Solicitor. Of counsel were Maximilian R. Peterson and Mark Nagumo, Associate Solicitors.

Before PAULINE NEWMAN, CLEVENGER, and DYK, Circuit Judges.

PAULINE NEWMAN, Circuit Judge.

Sang-Su Lee appeals the decision of the Board of Patent Appeals and Interferences of the United States Patent and Trademark Office, rejecting all of the claims of Lee's patent application Serial No. 07/631,210 entitled "Self-Diagnosis and Sequential-Display Method of Every Function." [FN1] We vacate the Board's decision for failure to meet the adjudicative standards for review under the Administrative Procedure Act, and remand for further proceedings.

FN1. *Ex parte Lee,* No.1994-1989 (Bd. Pat.App. & Int. Aug. 30, 1994; on reconsid'n Sept. 29, 1999).

The Prosecution Record

Mr. Lee's patent application is directed to a method of automatically displaying the functions of a video display device and demonstrating how to select and adjust the functions in order to facilitate response by the user. The display and demonstration are achieved using computer-managed electronics, including pulse-width modulation and auto-fine-tuning pulses, in accordance with procedures described in the specification. Claim 10 is representative:

> 10. A method for automatically displaying functions of a video display device, comprising:
> determining if a demonstration mode is selected;
> if said demonstration mode is selected, automatically entering a picture adjustment mode having a picture menu screen displaying a list of a plurality of picture functions; and
> automatically demonstrating selection and

adjustment of individual ones of said plurality of picture functions.

The examiner rejected the claims on the ground of obviousness, citing the combination of two references: United States Patent No. 4,626,892 to Nortrup, and the Thunderchopper Helicopter Operations ***1341** Handbook for a video game. The Nortrup reference describes a television set having a menu display by which the user can adjust various picture and audio functions; however, the Nortrup display does not include a demonstration of how to adjust the functions. The Thunderchopper Handbook describes the Thunderchopper game's video display as having a "demonstration mode" showing how to play the game; however, the Thunderchopper Handbook makes no mention of the adjustment of picture or audio functions. The examiner held that it would have been obvious to a person of ordinary skill to combine the teachings of these references to produce the Lee system.

Lee appealed to the Board, arguing that the Thunderchopper Handbook simply explained how to play the Thunderchopper game, and that the prior art provided no teaching or motivation or suggestion to combine this reference with Nortrup, or that such combination would produce the Lee invention. The Board held that it was not necessary to present a source of a teaching, suggestion, or motivation to combine these references or their teachings. The Board stated:

> The conclusion of obviousness may be made from common knowledge and common sense of a person of ordinary skill in the art without any specific hint or suggestion in a particular reference.

Board op. at 7. The Board did not explain the "common knowledge and common sense" on which it relied for its conclusion that "the combined teachings of Nortrup and Thunderchopper would have suggested the claimed invention to those of ordinary skill in the art."

Lee filed a request for reconsideration, to which the Board responded after five years. The Board reaffirmed its decision, stating that the Thunderchopper Handbook was "analogous art" because it was "from the same field of endeavor" as the Lee invention, and that the field of video games was "reasonably pertinent" to the problem of adjusting display functions because the Thunderchopper Handbook showed video demonstrations of the "features" of the game. On the matter of motivation to combine the Nortrup and Thunderchopper references, the Board stated that "we maintain the position that we stated in our prior decision" and that the Examiner's Answer provided "a well reasoned discussion of why there is sufficient motivation to combine the references." The Board did not state the examiner's reasoning, and review of the Examiner's Answer reveals that the examiner merely stated that both the Nortrup function menu and the Thunderchopper demonstration mode are program features and that the Thunderchopper mode "is user-friendly" and it functions as a tutorial, and that it would have been obvious to combine them.

Lee had pressed the examiner during prosecution for some teaching, suggestion, or motivation in the prior art to select and combine the references that were relied on to show obviousness. The Examiner's Answer before the Board, plus a Supplemental Answer, stated that the combination of Thunderchopper with Nortrup "would have been obvious to one of ordinary skill in the art since the demonstration mode is just a programmable feature which can be used in many different device[s] for providing automatic introduction by adding the proper programming software," and that "another motivation would be that the automatic demonstration mode is user friendly and it functions as a tutorial." The Board adopted the examiner's answer, stating "the examiner has provided a well reasoned discussion of these references and how the combination of these references meets the claim limitations." However, perhaps recognizing that the examiner had provided insufficient justification to ***1342** support combining the Nortrup and Thunderchopper references, the Board held, as stated *supra,* that a "specific hint or suggestion" of motivation to combine was not required.

This appeal followed.

Judicial Review

[1] Tribunals of the PTO are governed by the Administrative Procedure Act, and their rulings receive the same judicial deference as do tribunals of other administrative agencies. *Dickinson v. Zurko,* 527 U.S. 150, 119 S.Ct. 1816, 144 L.Ed.2d

143, 50 USPQ2d 1930 (1999). Thus on appeal we review a PTO Board's findings and conclusions in accordance with the following criteria:

> 5 U.S.C. § 706(2) The reviewing court shall--
> (2) hold unlawful and set aside agency actions, findings, and conclusions found to be--
> (A) arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law;
>
> * * * * * *
>
> (E) unsupported by substantial evidence in a case subject to sections 556 and 557 of this title or otherwise reviewed on the record of an agency hearing provided by statute;

[2][3] For judicial review to be meaningfully achieved within these strictures, the agency tribunal must present a full and reasoned explanation of its decision. The agency tribunal must set forth its findings and the grounds thereof, as supported by the agency record, and explain its application of the law to the found facts. The Court has often explained:

> The Administrative Procedure Act, which governs the proceedings of administrative agencies and related judicial review, establishes a scheme of "reasoned decisionmaking." Not only must an agency's decreed result be within the scope of its lawful authority, but the process by which it reaches that result must be logical and rational.

Allentown Mack Sales and Service, Inc. v. National Labor Relations Bd., 522 U.S. 359, 374, 118 S.Ct. 818, 139 L.Ed.2d 797 (1998) (citation omitted). This standard requires that the agency not only have reached a sound decision, but have articulated the reasons for that decision. The reviewing court is thus enabled to perform meaningful review within the strictures of the APA, for the court will have a basis on which to determine "whether the decision was based on the relevant factors and whether there has been a clear error of judgment." *Citizens to Preserve Overton Park v. Volpe,* 401 U.S. 402, 416, 91 S.Ct. 814, 28 L.Ed.2d 136 (1971). Judicial review of a Board decision denying an application for patent is thus founded on the obligation of the agency to make the necessary findings and to provide an administrative record showing the evidence on which the findings are based, accompanied by the agency's reasoning in reaching its conclusions. *See In re Zurko,* 258 F.3d 1379, 1386, 59 USPQ2d 1693, 1697 (Fed.Cir.2001) (review is on the administrative record); *In re Gartside,* 203 F.3d 1305, 1314, 53 USPQ2d 1769, 1774 (Fed.Cir.2000) (Board decision "must be justified within the four corners of the record").

[4][5] As applied to the determination of patentability *vel non* when the issue is obviousness, "it is fundamental that rejections under 35 U.S.C. § 103 must be based on evidence comprehended by the language of that section." *In re Grasselli,* 713 F.2d 731, 739, 218 USPQ 769, 775 (Fed.Cir.1983). The essential factual evidence on the issue of obviousness is set forth in *Graham v. John Deere Co.,* 383 U.S. 1, 17-18, 86 S.Ct. 684, 15 L.Ed.2d 545, 148 USPQ 459, 467 (1966) and extensive ensuing precedent. The patent examination ***1343** process centers on prior art and the analysis thereof. When patentability turns on the question of obviousness, the search for and analysis of the prior art includes evidence relevant to the finding of whether there is a teaching, motivation, or suggestion to select and combine the references relied on as evidence of obviousness. *See, e.g., McGinley v. Franklin Sports, Inc.,* 262 F.3d 1339, 1351-52, 60 USPQ2d 1001, 1008 (Fed.Cir.2001) ("the central question is whether there is reason to combine [the] references," a question of fact drawing on the *Graham* factors).

[6] "The factual inquiry whether to combine references must be thorough and searching." *Id.* It must be based on objective evidence of record. This precedent has been reinforced in myriad decisions, and cannot be dispensed with. *See, e.g., Brown & Williamson Tobacco Corp. v. Philip Morris Inc.,* 229 F.3d 1120, 1124-25, 56 USPQ2d 1456, 1459 (Fed.Cir.2000) ("a showing of a suggestion, teaching, or motivation to combine the prior art references is an 'essential component of an obviousness holding' ") (quoting *C.R. Bard, Inc., v. M3 Systems, Inc.,* 157 F.3d 1340, 1352, 48 USPQ2d 1225, 1232 (Fed.Cir.1998)); *In re Dembiczak,* 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed.Cir.1999) ("Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references."); *In re Dance,* 160 F.3d 1339,

1343, 48 USPQ2d 1635, 1637 (Fed.Cir.1998) (there must be some motivation, suggestion, or teaching of the desirability of making the specific combination that was made by the applicant); *In re Fine,* 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (Fed.Cir.1988) (" 'teachings of references can be combined *only* if there is some suggestion or incentive to do so.' ") (emphasis in original) (quoting *ACS Hosp. Sys., Inc. v. Montefiore Hosp.,* 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed.Cir.1984)).

The need for specificity pervades this authority. *See, e.g., In re Kotzab,* 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1317 (Fed.Cir.2000) ("particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed"); *In re Rouffet,* 149 F.3d 1350, 1359, 47 USPQ2d 1453, 1459 (Fed.Cir.1998) ("even when the level of skill in the art is high, the Board must identify specifically the principle, known to one of ordinary skill, that suggests the claimed combination. In other words, the Board must explain the reasons one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious."); *In re Fritch,* 972 F.2d 1260, 1265, 23 USPQ2d 1780, 1783 (Fed.Cir.1992) (the examiner can satisfy the burden of showing obviousness of the combination "only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references").

[7][8][9] With respect to Lee's application, neither the examiner nor the Board adequately supported the selection and combination of the Nortrup and Thunderchopper references to render obvious that which Lee described. The examiner's conclusory statements that "the demonstration mode is just a programmable feature which can be used in many different device[s] for providing automatic introduction by adding the proper programming software" and that "another motivation would be that the automatic demonstration mode is user friendly and it functions as a tutorial" do not adequately address the issue of motivation to combine. This factual question ***1344** of motivation is material to patentability, and could not be resolved on subjective belief and unknown authority. It is improper, in determining whether a person of ordinary skill would have been led to this combination of references, simply to "[use] that which the inventor taught against its teacher." *W.L. Gore v. Garlock, Inc.,* 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed.Cir.1983). Thus the Board must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the agency's conclusion.

[10] Deferential judicial review under the Administrative Procedure Act does not relieve the agency of its obligation to develop an evidentiary basis for its findings. To the contrary, the Administrative Procedure Act reinforces this obligation. *See, e.g., Motor Vehicle Manufacturers Ass'n v. State Farm Mutual Automobile Ins. Co.,* 463 U.S. 29, 43, 103 S.Ct. 2856, 77 L.Ed.2d 443 (1983) ("the agency must examine the relevant data and articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.' ") (quoting *Burlington Truck Lines v. United States,* 371 U.S. 156, 168, 83 S.Ct. 239, 9 L.Ed.2d 207 (1962)); *Securities & Exchange Comm'n v. Chenery Corp.,* 318 U.S. 80, 94, 63 S.Ct. 454, 87 L.Ed. 626 (1943) ("The orderly function of the process of review requires that the grounds upon which the administrative agency acted are clearly disclosed and adequately sustained.").

[11] In its decision on Lee's patent application, the Board rejected the need for "any specific hint or suggestion in a particular reference" to support the combination of the Nortrup and Thunderchopper references. Omission of a relevant factor required by precedent is both legal error and arbitrary agency action. *See Motor Vehicle Manufacturers,* 463 U.S. at 43, 103 S.Ct. 2856 ("an agency rule would be arbitrary and capricious if the agency ... entirely failed to consider an important aspect of the problem"); *Mullins v. Department of Energy,* 50 F.3d 990, 992 (Fed.Cir.1995) ("It is well established that agencies have a duty to provide reviewing courts with a sufficient explanation for their decisions so that those decisions may be judged against the relevant statutory standards, and that failure to provide such an explanation is

grounds for striking down the action."). As discussed in *National Labor Relations Bd. v. Ashkenazy Property Mgt. Corp.,* 817 F.2d 74, 75 (9th Cir.1987), an agency is "not free to refuse to follow circuit precedent."

[12] The foundation of the principle of judicial deference to the rulings of agency tribunals is that the tribunal has specialized knowledge and expertise, such that when reasoned findings are made, a reviewing court may confidently defer to the agency's application of its knowledge in its area of expertise. Reasoned findings are critical to the performance of agency functions and judicial reliance on agency competence. *See Baltimore and Ohio R.R. Co. v. Aberdeen & Rockfish R.R. Co.,* 393 U.S. 87, 91-92, 89 S.Ct. 280, 21 L.Ed.2d 219 (1968) (absent reasoned findings based on substantial evidence effective review would become lost "in the haze of so-called expertise"). The "common knowledge and common sense" on which the Board relied in rejecting Lee's application are not the specialized knowledge and expertise contemplated by the Administrative Procedure Act. Conclusory statements such as those here provided do not fulfill the agency's obligation. This court explained in *Zurko,* 258 F.3d at 1385, 59 USPQ2d at 1697, that "deficiencies of the cited references cannot be remedied by the Board's general conclusions about what is 'basic knowledge' or 'common sense.' " The ***1345** Board's findings must extend to all material facts and must be documented on the record, lest the "haze of so-called expertise" acquire insulation from accountability. "Common knowledge and common sense," even if assumed to derive from the agency's expertise, do not substitute for authority when the law requires authority. *See Allentown Mack,* 522 U.S. at 376, 118 S.Ct. 818 ("Because reasoned decisionmaking demands it, and because the systemic consequences of any other approach are unacceptable, the Board must be required to apply in fact the clearly understood legal standards that it enunciates in principle....")

The case on which the Board relies for its departure from precedent, *In re Bozek,* 57 C.C.P.A. 713, 416 F.2d 1385, 163 USPQ 545 (1969), indeed mentions "common knowledge and common sense," the CCPA stating that the phrase was used by the Solicitor to support the Board's conclusion of obviousness based on evidence in the prior art. *Bozek* did not hold that common knowledge and common sense are a substitute for evidence, but only that they may be applied to analysis of the evidence. *Bozek* did not hold that objective analysis, proper authority, and reasoned findings can be omitted from Board decisions. Nor does *Bozek,* after thirty-two years of isolation, outweigh the dozens of rulings of the Federal Circuit and the Court of Customs and Patent Appeals that determination of patentability must be based on evidence. This court has remarked, in *Smiths Industries Medical Systems, Inc. v. Vital Signs, Inc.,* 183 F.3d 1347, 1356, 51 USPQ2d 1415, 1421 (Fed.Cir.1999), that *Bozek* 's reference to common knowledge "does not in and of itself make it so" absent evidence of such knowledge.

[13][14][15][16] The determination of patentability on the ground of unobviousness is ultimately one of judgment. In furtherance of the judgmental process, the patent examination procedure serves both to find, and to place on the official record, that which has been considered with respect to patentability. The patent examiner and the Board are deemed to have experience in the field of the invention; however, this experience, insofar as applied to the determination of patentability, must be applied from the viewpoint of "the person having ordinary skill in the art to which said subject matter pertains," the words of section 103. In finding the relevant facts, in assessing the significance of the prior art, and in making the ultimate determination of the issue of obviousness, the examiner and the Board are presumed to act from this viewpoint. Thus when they rely on what they assert to be general knowledge to negate patentability, that knowledge must be articulated and placed on the record. The failure to do so is not consistent with either effective administrative procedure or effective judicial review. The board cannot rely on conclusory statements when dealing with particular combinations of prior art and specific claims, but must set forth the rationale on which it relies.

Alternative Grounds

At oral argument the PTO Solicitor proposed alternative grounds on which this court might affirm the Board's decision. However, as stated in *Burlington Truck Lines, Inc. v. United States,* 371 U.S. 156, 168, 83 S.Ct. 239, 9 L.Ed.2d 207 (1962),

"courts may not accept appellate counsel's *post hoc* rationalization for agency action." Consideration by the appellate tribunal of new agency justifications deprives the aggrieved party of a fair opportunity to support its position; thus review of an administrative decision must be made on the grounds relied on by the agency. "If those grounds are inadequate or improper, the court is powerless to affirm the administrative action by substituting what it considers ***1346** to be a more adequate or proper basis." *Securities & Exchange Comm'n v. Chenery Corp.,* 332 U.S. 194, 196, 67 S.Ct. 1575, 91 L.Ed. 1995 (1947). As reiterated in *Federal Election Comm'n v. Akins,* 524 U.S. 11, 25, 118 S.Ct. 1777, 141 L.Ed.2d 10 (1998), "If a reviewing court agrees that the agency misinterpreted the law, it will set aside the agency's action and remand the case--even though the agency (like a new jury after a mistrial) might later, in the exercise of its lawful discretion, reach the same result for a different reason." Thus we decline to consider alternative grounds that might support the Board's decision.

Further Proceedings

[17] Sound administrative procedure requires that the agency apply the law in accordance with statute and precedent. The agency tribunal must make findings of relevant facts, and present its reasoning in sufficient detail that the court may conduct meaningful review of the agency action. In *Radio-Television News Directors Ass'n v. FCC,* 184 F.3d 872 (D.C.Cir.1999) the court discussed the "fine line between agency reasoning that is 'so crippled as to be unlawful' and action that is potentially lawful but insufficiently or inappropriately explained," quoting from *Checkosky v. Securities & Exch. Comm'n,* 23 F.3d 452, 464 (D.C.Cir.1994); the court explained that "[i]n the former circumstance, the court's practice is to vacate the agency's order, while in the latter the court frequently remands for further explanation (including discussion of the relevant factors and precedents) while withholding judgment on the lawfulness of the agency's proposed action." *Id.* at 888. In this case the Board's analysis of the Lee invention does not comport with either the legal requirements for determination of obviousness or with the requirements of the Administrative Procedure Act that the agency tribunal set forth the findings and explanations needed for "reasoned decisionmaking." Remand for these purposes is required. *See Overton Park,* 401 U.S. at 420- 421, 91 S.Ct. 814 (remanding for further proceedings appropriate to the administrative process).

VACATED AND REMANDED.

277 F.3d 1338, 61 U.S.P.Q.2d 1430

Briefs and Other Related Documents (Back to top)

- 2000 WL 34252120 (Appellate Brief) Reply Brief for Appellant (May. 22, 2000)Original Image of this Document with Appendix (PDF)

- 2000 WL 34252119 (Appellate Brief) Brief for Appellee Director of the United States Patent and Trademark Office (May. 08, 2000)Original Image of this Document (PDF)

- 2000 WL 34252118 (Appellate Brief) Combined Brief for Appellant and Appendix (Mar. 10, 2000)Original Image of this Document with Appendix (PDF)

- 00-1158 (Docket)
(Nov. 29, 1999)

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held at distances of approximately 5 inches and 6 inches from the surface to be coated, while Shepard in the Shepard (II) patent in describing an example of his process, calls for a spray distance of "approximately 4 inches in length" for the application of the molybdenum to the metal. In spraying molybdenum "according to the Shepard process disclosed in said patents," the affiant could, obviously, have employed a spray distance of approximately 4, 5 or 6 inches. The distances mentioned in the two Shepard patents might well be effective, especially since, as we have noted, no specific distances are stated by appellant in his specification.

The affiant also attributes a "higher temperature for the work piece" as a reason for the improved bond strength. The Shepard patents, however, indicate the need for a sufficiently high temperature in the melting zone. Both of the Shepard patents state:

> "Excessive oxidation conditions may be avoided by using a relatively slow wire speed for the molybdenum as it feeds through the gun and by using oxygen as little as possible and *still obtain a sufficiently high temperature in the melting zone.*" [Emphasis ours.]

Moreover, the affiant makes no mention of the specific temperatures employed in producing the test specimens.

Appellant contends that the sufficiency or probative value of the affidavit "is believed to be moot or 'adjudicated' since the Patent Office has already twice accepted it and considered it favorably." It does appear that the same affidavit was submitted in two applications which have now matured into patents. However, it is obvious that that has no bearing on the present case. The considerations which led to the allowance of those patents are not matters of record in this proceeding. The only issue here is whether the affidavit supports appellant's contention that his invention is patentable over the cited references. We do not think that the affidavit has this effect.

In summary, the Hensel et al. patent and the Coppen patent disclose, respectively, a steel reinforced aluminum alloy bearing and the use of oil grooves in a bearing. We think it would be obvious to a person of ordinary skill in the art to employ the Shepard process with the teachings of the Hensel et al. and Coppen patents to produce appellant's invention.

For the foregoing reasons the decision of the board is affirmed.

Affirmed.

50 CCPA

Application of Giorgio G. SOLI.

Patent Appeal No. 6999.

United States Court of Customs and Patent Appeals.

June 6, 1963.

Application for patent for petroleum and natural gas prospecting method by determining presence and relative amounts of hydrocarbon-oxidizing bacteria in the soil at various depths. The Board of Appeals of the United States Patent Office, Serial No. 587,521, affirmed examiner's rejection of method claim and the applicant appealed. The United States Court of Customs and Patent Appeals, Rich, Judge, held that the method was unpatentable in view of the prior art.

Affirmed.

1. Patents ⇐113(1)

Wherever possible, issues should be crystallized before appeal to United States Court of Customs and Patent Appeals.

2. Patents ⇐113(1)

It is neither function of oral arguments nor briefs before United States Court of Customs and Patent Appeals

to question for first time propriety of actions of patent examiner or board of appeals to which a response conveniently could have been made before patent office.

3. Evidence ⇐21

United States Court of Customs and Patent Appeals would take judicial notice of use of controls in various experimental procedures.

4. Patents ⇐17(1)

It is well within ordinary skill of art to use a control in experimental procedures.

5. Patents ⇐113(7)

When patent office finds differences between subject matter sought to be patented and prior art, it may not, without some basis in logic or scientific principle, merely allege that such differences are either obvious or of no patentable significance and thereby force an applicant to prove conclusively that patent office is wrong. 35 U.S.C.A. § 103.

6. Patents ⇐113(7)

Proof that an applicant must offer to overcome a position of patent office supporting a rejection can be determined only on basis of facts in any particular case.

7. Patents ⇐66(1.24)

Method for petroleum and natural gas prospecting by determining presence and relative amounts of hydrocarbon-oxidizing bacteria in soil at various depths was unpatentable in view of prior art.

Conder C. Henry, Washington, D. C., for appellant.

Clarence W. Moore, Washington, D. C. (Raymond E. Martin, Washington, D. C., of counsel), for the Commissioner of Patents.

Before WORLEY, Chief Judge, and RICH, MARTIN, SMITH, and ALMOND, Jr., Judges.

RICH, Judge.

This appeal is from the decision of the Patent Office Board of Appeals affirming the examiner's rejection of method claim 13, the sole claim in application Ser. No. 587,521, filed May 28, 1956, for "Petroleum and Natural Gas Prospecting."

The basis for and the general nature of appellant's invention is disclosed in the specification as follows:

> "The method is based on the fact that, in many instances in oil and gas areas, gaseous hydrocarbons are slowly escaping through the sedimentary formations to the surface. These gases serve as a steady supply of carbon and energy to hydrocarbon-oxidizing bacteria, resulting in the intensive multiplication of these micro-organisms.
>
> * * * * * *
>
> "The present invention is directed to a method of determining the presence and relative amounts of hydrocarbon-oxidizing bacteria in the soil, these bacteria being an indication of the presence of petroleum hydrocarbons. A feature of the invention is utilization of the ability of hydrocarbon-oxidizing bacteria to grow and produce turbidity [i. e., a murky or muddied condition] in a liquid mineral culture medium in which a hydrocarbon gas is dissolved."

Claim 13 reads as follows (the breakdown being ours):

> "13. A method of prospecting for subterranean hydrocarbon deposits comprising the steps of
>
> "[1] collecting samples of soil at various depths in certain locations in a prospective area,
>
> "[2] incubating at least one culture of each of said soil samples in a mineral nutrient liquid medium in the presence of an atmosphere of methane,
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> "[3] simultaneously incubating at least another of said cultures of each of the same soil sample in a mineral nutrient liquid medium in the presence of an atmosphere of propane,
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"[5] determining the amount of hydrocarbon-oxidizing bacteria in said cultures by

"(a) a measurement of the amount of turbidity of said nutrient medium caused by the growth of said bacteria exposed to said methane and propane atmospheres, and

"(b) using said culture incubated in the presence of atmospheric air as a control for said first-mentioned cultures,

"[6] the ratio of soil to culture medium being kept to a minimum."

The Patent Office has rejected this claim as unpatentable over the combined teachings of the following references:

Taggart 2,349,472 May 23, 1944
Strawinski 2,665,237 Jan. 5, 1954
Porter, Bacterial Chemistry and Physiology, John Wiley & Sons, Inc., 1946, page 95.

Both Taggart and Strawinski disclose methods of prospecting for subterranean hydrocarbon deposits which include collecting samples of soil at various depths in certain locations in a prospective area and thereafter employing various means to analyze the amount of and/or kind of hydrocarbon-oxidizing bacteria in such samples. The pertinence of the Porter reference will be discussed later.

Appellant's several arguments as to why the references of record would not render his invention obvious to one skilled in the art will be considered as they relate to the above-designated sections of his claim.

Section [1]: *Soil Sampling Depth.*

Appellant argues in his brief

"Particular attention is given [in appellant's invention] to the depth of sampling in relation to the amount of organic matter in the soil, since appreciable amount of such organic matter could unfavorably affect the final results. The amount of organic matter decreases with depth; therefore, the deeper the samples within certain limits, the more reliable the results. Decomposition of organic matter in the first layers of soil could give rise to methane gas, which would support methane-oxidizing bacteria, which, in turn, would furnish false positive results as far as the presence of oil and gas at greater depths is concerned. For this reason alone, it is submitted, appellant's claim is patentable over Taggert [sic], who specifies 6 inches of surface soil, and Strawinski, who also specifies surface soil at a slightly greater depth. [Strawinski designates this depth as "below six inches, preferably at depths of 24" or more."]"

It is clear that the disclosure in appellant's specification does not make soil-sampling depth critical. At one portion thereof it states that soil samples should be taken "at a depth not less than 6 feet." Another portion thereof states, however, merely that soil samples should be collected "at a depth where organic matter is reduced to a minimum." In view of these facts and additionally in view of the fact that we can see no distinction of substance between a depth of soil sampling which may be less than 6 feet and one, as disclosed in Strawinski, which may be two feet "or more" we are not persuaded, by appellant's argument that we should "interpret" the claim in the light of his specification disclosure, that even such an "interpretation" would distinguish the claim from the prior art. All the claim contains by way of limitation is "various depths." It appears to include depths of the prior art.

Sections [2] and [3]: *Simultaneously Incubating in Different Atmospheres Portions of the Same Soil Sample in a Liquid Medium.*

Appellant's specification discusses this aspect of his invention as follows:

"* * * this invention is directed to the simultaneous isolation of bac-

> teria able to use methane and to bacteria which attack ethane or propane but which may not be able to use methane. Since we know that neither ethane nor propane are commonly found in soil as a result of decomposition of organic matter, the separate use of methane and propane (or ethane) as test gasses on the same soil sample is an important part of this invention."

To this end appellant places a measured amount of a liquid "culture medium" into five vials.[1] These vials are then "innoculated" with measured amounts of soil. Two of the vials are then filled with methane, two with propane. The contents of the fifth vial will be discussed, infra. The vials are then incubated for two weeks at a temperature of approximately 28° to 30°C.

As to the reason why methane and propane atmospheres should not be mixed, the specification says:

"If growths occurred only in the cultures incubated under an atmosphere of methane, the results for these particular soil samples are held as questionable, for the presence of bacteria able only to oxidize methane, cannot be taken as a positive indication of petroleum hydrocarbons for reasons explained above. If bacterial growth occurred both in methane and propane-exposed cultures, then the results are recorded as positive." [2]

The relationship between the above portions of appellant's disclosure and the relevant portions of the Taggart and Strawinski references can readily be seen from the following analysis thereof made by the board:

> "Taggart takes samples of soil from spaced points in the area under investigation, and places each sample in a sealed chamber containing a hydrocarbon gas and oxygen. The samples are allowed to stand for a previously selected period of time. Taggart found that when a sample contains substantial amounts of hydrocarbon-consuming bacteria a pressure drop occurs in the atmosphere above the sample. A manometer attached to the chamber containing the sample is read periodically and the drops in the pressure are recorded. * * *.
>
> "Strawinski is asserted to be an improvement on the Taggart method. Strawinski collects samples from the area under investigation in the same general manner as Taggart. Each sample is thoroughly mixed with a nutrient medium and about 50 ml of the mixture is placed in a reactor vessel. A gas mixture preferably composed of carbon dioxide, oxygen or air and methane at substantially atmospheric pressure is then admitted to the reactor vessel and the latter is connected by a siphon arrangement to a reservoir under atmospheric pressure containing the same nutrient medium that was mixed with the soil sample. The reactor vessel contents are then allowed to

1. In discussing the culture medium appellant's specification says:

> "The composition of the culture medium needs also particular attention, especially in the method described herein as the method itself relies for its diagnostic aims on the presence or absence of bacterial growth. The medium, therefore, should be such as to promote the growth of hydrocarbon-oxidizing bacteria and discourage the growth of other micro-organisms."

Inasmuch, however, as claim 13 does not state the composition of this medium, we will not consider further the particular composition of appellant's liquid culture medium.

2. Appellant's reference to "recorded" results is directed to the fact that after the degree of turbidity of the vial cultures is determined and the results labeled as positive or questionable, these results are placed on a map of the area from which the soil samples were taken, next to the particular soil sample to which the results relate. Lines are drawn on this map connecting the points of soil sampling where the soil contains equal amounts of hydrocarbon-oxidizing bacteria as determined by the method of the appealed claim. A similar mapping of test results is disclosed by Strawinski.

undergo incubation at a temperature of 25 to 35°C. After standing for some time it is observed that some of the nutrient medium has passed from the reservoir into the reactor vessel by reason of consumption of gas in the latter vessel by the microorganisms in the soil sample. This transfer of nutrient medium from the reservoir to the reactor is permitted to continue until an arbitrarily selected liquid level is reached in the reactor vessel. The patentee states that a liquid level corresponding to a volume of 100 ml is sufficient to indicate with sufficient accuracy completion of the reaction of the microorganisms on the hydrocarbon. Strawinski therefore measures the time which elapses for the level of liquid in the reactor to reach the 100 ml mark, and this time is an indication of the activity of the microorganisms in the sample."

We also note with respect to Taggart that he discloses—

"* * * that the general principle involved in the present invention can be utilized without following the specific procedure outlined above. * * *. Another refinement is to divide each sample into portions and subject one portion to the action of methane, while another portion is subjected to the action of heavier hydrocarbons under the same conditions, the same concentration of hydrocarbons being used in each case. This procedure serves to eliminate errors which might arise by reason of the fact that the soil may contain bacteria which have a preferential action on methane."

We think it unquestionably clear that Taggart discloses appellant's contemplated *simultaneous* incubation, in *different* hydrocarbon atmospheres, of portions of the same soil sample. We consider unimportant the fact that Taggart does not employ in these incubations a liquid nutrient medium inasmuch as Strawinski clearly discloses that the art had recognized the existence of uncontrollable "variables" which would be encountered in attempting an incubation of hydrocarbon-oxidizing bacteria in the absence of such a medium. In this regard Strawinski states:

"* * * such variables are eliminated by the use of a relatively large amount of [liquid] nutrient which amount compared to any moisture content of the sample and any nutrient content is so large that any variations in moisture or nutrient content are substantially 'ironed out' and each sample virtually standardized."

Sections 4 and 5(b): *Incubating in Atmospheric Air Another Portion of the Same Soil Sample in a Liquid Medium and Using This Incubation as a "Control."*

The contents of appellant's previously noted fifth vial differs from those of his others only in that atmospheric air is used therein rather than a hydrocarbon gas. The reason for this additional vial is disclosed as follows:

"If the soil samples were taken in the described manner, no [bacterial] growth will occur in the culture incubated under atmospheric air, as the hydrocarbon-oxidizing bacteria eventually present will not develop due to the absence of a carbon source. This serves as a control to ascertain that the eventual bacteria growths in the hydrocarbon-exposed cultures are not due to a carbon source other than the hydrocarbon."

The Patent Office position relating to the patentable significance of a control was set forth by the examiner. He said:

"Applicant states that Taggart has no such control like applicant's. There is no issue taken with this view, but when one is attempting to determine the number of bacterial cells that have come to be since a certain time lapse, how can that determination possibly be made without a control? Such a control is stand-

ard procedure throughout the entire field of bacteriology." [3]

The solicitor notes that this statement by the examiner is "unchallenged." Appellant responds by asking whether he must deny all allegations of the examiner before he can appeal.

[1–4] This court has long held that wherever possible, issues should be crystallized *before* appeal to this court. It is neither the function of oral arguments nor briefs before this court to question for the first time the propriety of actions of the examiner or the board to which a response conveniently could have been made before the Patent Office. See In re Chevenard, 139 F.2d 711, 31 CCPA 802. This is not a case where the examiner's allegation appears to be based on mere conjecture. On the contrary, this court takes judicial notice of the use of "controls" in various experimental procedures.[4] Even if we were to assume, arguendo, that the rule of this court were not as stated in the Chevenard case, we noted that appellant's attempt to refute what we think is the justifiable position of the Patent Office relating to the *skill of the art* consists merely of stressing what the Patent Office has admitted—that neither Strawinski nor Taggart discloses, by itself, the use of a control. On the question before us, we think that fact is not significant. It is well within ordinary skill of the art to use a control.

Section 5(a): *Determining the Amount of Hydrocarbon-Oxidizing Bacteria in the Cultures by Measuring the Turbidity of the Nutrient Medium.*

Appellant's disclosure in this regard states:

"The degree of turbidity in each of the four hydrocarbon-incubated cultures is * * * measured by means of a colorimeter-spectrophotometer, * * * and the average turbidity from the four cultures [other than that using air as an atmosphere] for each soil sample calculated on the basis of transmission readings."

In discussing the pertinence of the reference disclosures on this point, appellant states: "Admittedly, the measurement of turbidity of a bacterial culture as an index of the number of bacteria present, is an old process. It is disclosed by Porter." He argues, however, that when his method is "viewed in its entirety" it may not properly be said that he has merely substituted Porter's method of estimating the number of bacteria present for either Taggart's or Strawinski's pressure-drop method. We do not agree. Appellant's argument seems to be predicated, at least in part, on the idea that his bacterial measurement is somehow more "direct" than that of either Taggart or Strawinski. We see no distinction, insofar as directness of measurement of bacterial growth is concerned, between the bacterial measurement method used by either Taggart or Strawinski on the one hand and that used by Porter and appellant on the other. Porter actually refers to the "*Opacity Method*" for "the enumeration of bacteria" as being an "indirect" method. Whatever doubt we might have on this point we would resolve against appellant in view of Strawinski's disclosure that a "spectrophotometer," while "not essential" in his process, may be used "to determine the actual amount of hydrocarbon consumed in milliliters." We feel that one skilled in the art, knowing from Strawinski that a photometric measure-

3. The Porter reference, while not cited by the Patent Office for this reason, would seem to support the examiner's position. It states:

"*Indirect Count.* Several methods have been proposed for the enumeration of bacteria by indirect methods.

"1. *The Opacity Method.* The opacity of the bacterial suspension to be estimated by this method is *compared with a control suspension of standard opacity*, such as a barium sulfate solution or a bacterial suspension which has been previously counted." [Last emphasis ours.]

4. One need not stir from the TV to discover that "control" groups are used in such everyday occurrences as the testing of the efficacy of toothpaste.

ment had been used for one purpose in the gas and oil prospecting art, if wishing to improve the method of enumerating bacteria in a process utilizing a light-transmitting liquid culture medium, would be expected to turn to other references dealing with photometric measurements, similar to Porter, to see what other possible utilization could be made of such an *indirect* measuring means.

Section 6: *The Ratio of Soil to Culture Medium Being Kept to a Minimum.*

The board in discussing appellant's arguments relating to this section of the claim said:

> "Appellant emphasizes that he keeps the ratio of soil to culture medium at a minimum. We are constrained to agree with the Examiner that this appears to be no more than conventional procedure in bacteriological experiments. Further, it appears to us that Strawinski would have a large excess of culture medium relative to soil."

We have not been persuaded by appellant that this position of the Patent Office "is unsound." As the solicitor would say, the board's allegation with respect to Strawinski is "unchallenged" even on appeal to this court. Furthermore, we see in appellant's specification in this regard merely a statement that a certain ratio of soil to culture medium "is the most satisfactory." No statement is contained therein that would give any basis to appellant's contention that a particular ratio is critical, nor, for that matter, what this ratio may be inasmuch as it is referred to merely as a "minimum."

[5–7] When, as in the instant case, the Patent Office finds, in the words of 35 U.S.C. § 103, "differences between the subject matter sought to be patented and the prior art," it may not, without some basis in logic or scientific principle, merely allege that such differences are either obvious or of no patentable significance and thereby force an appellant to prove conclusively that it is wrong. Such is not and never has been the rule relating to burden of proof in this court. What proof an applicant must offer to overcome a position of the Patent Office supporting a rejection can be determined only on the basis of the facts in any particular case. In the instant case, however, the office position relating to the alleged obviousness of the differences which exist between the claimed invention and the prior art seems to us to be founded both on logic and sound scientific principle. We find that appellant failed to rebut this position.

The decision of the board is affirmed.

Affirmed.

50 CCPA

Application of Charles BLOCK and John R. Gardner.

Patent Appeal No. 6900.

United States Court of Customs and Patent Appeals.

June 6, 1963.

Proceeding on application for a patent for a photoprinting apparatus. The Board of Appeals of the United States Patent Office, Serial No. 676,261, affirmed examiner's rejection of claims 40 and 41 of the application, and applicants appealed, but withdrew their appeal as to claim 41. The Court of Customs and Patent Appeals, Smith, Judge, held that claim 40 was properly rejected as unpatentable over the prior art.

Affirmed.

Patents ⇐66(1.25)

Claim 40 of an application for a patent for a photoprinting apparatus was properly rejected as unpatentable over the prior art.

Dale A. Bauer, Bauer & Seymour, New York City, for appellants.

Clarence W. Moore, Washington, D. C. (S. Wm. Cochran, Washington, D. C., of counsel), for Commissioner of Patents.

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as did the employee in *Paisley*, is not determinative of whether Mr. Woodman had a "career" in the military. Instead, Mr. Woodman's actions created a de facto resignation by indicating to PNG that he never intended to return to his civilian position. Mr. Woodman was separated from his NGT position in 1981, and he did not seek reemployment with the PNG as an NGT until nearly fourteen years later in 1995. Substantial evidence supports the Board's finding of career service.

CONCLUSION

For the foregoing reasons, Mr. Woodman is not entitled to reemployment rights under either VRRA or USERRA. The decision of the Board therefore is

AFFIRMED.

No costs.

In re Mary E. ZURKO, Thomas A. Casey, Jr., Morrie Gasser, Judith S. Hall, Clifford E. Kahn, Andrew H. Mason, Paul D. Sawyer, Leslie R. Kendall, and Steven B. Lipner.

Nos. 96–1258, 07/479,666.

United States Court of Appeals, Federal Circuit.

Aug. 2, 2001.

Patent applicant appealed decision of Board of Patent Appeals and Interferences rejecting application for patent relating to method for improving security in computer systems. The Court of Appeals for the Federal Circuit, 111 F.3d 887, reversed on original submission, and again reversed on rehearing en banc, 142 F.3d 1447. Certiorari was granted and the Supreme Court reversed and remanded, 527 U.S. 150, 119 S.Ct. 1816, 144 L.Ed.2d 143. On remand, the Court of Appeals, Archer, Senior Circuit Judge, held that: (1) Board's reliance on alternative references was not warranted, and (2) Board's reliance merely on basic knowledge or common sense when evaluating patentability, not being based on any evidence in the record, was unwarranted.

Reversed.

1. Patents ⇐16(2, 3), 16.13, 36.1(1)

Obviousness is a legal question based on underlying factual determinations including: (1) the scope and content of the prior art, including what that prior art teaches explicitly and inherently; (2) the level of ordinary skill in the prior art; (3) the differences between the claimed invention and the prior art; and (4) objective evidence of nonobviousness. 35 U.S.C.A. § 103(a).

2. Patents ⇐113(6)

The Court of Appeals reviews the ultimate legal determination of obviousness of a claimed invention without deference. 35 U.S.C.A. § 103(a).

3. Patents ⇐113(6)

The Court of Appeals reviews factual findings underlying the determination of

Guard duty that results in eligibility for regular retirement from the Armed Forces is not considered non-career service.

32 C.F.R. § 104.3 (1997). Mr. Woodman's participation in the military was "continuous" and "repeated," because he was eligible for and received military retirement benefits.

obviousness of a claimed invention for substantial evidence. 35 U.S.C.A. § 103(a).

4. Administrative Law and Procedure ⇐791

"Substantial evidence" is such relevant evidence as a reasonable mind might accept as adequate to support a conclusion.

See publication Words and Phrases for other judicial constructions and definitions.

5. Administrative Law and Procedure ⇐791

A review under the substantial evidence standard involves an examination of the record as a whole, taking into consideration evidence that both justifies and detracts from the agency's decision; the possibility of drawing two inconsistent conclusions from the evidence does not prevent an administrative agency's finding from being supported by substantial evidence.

6. Administrative Law and Procedure ⇐791

The substantial evidence standard of review of an agency's decision is analogous to the review of jury findings, and it is more deferential than the clearly erroneous standard of review.

7. Patents ⇐16.14

Board of Patent Appeals reliance on alternative references, to conclude that patent application for method of improving security in computer systems was obvious, was not warranted; alternative references did not support Board's conclusion and reliance on new combination of references, not previously considered, would have constituted impermissible new ground for rejection. 35 U.S.C.A. § 103(a).

8. Patents ⇐111

The Board of Patent Appeals cannot simply reach conclusions based on its own understanding or experience, or on its assessment of what would be basic knowledge or common sense, rather, the Board must point to some concrete evidence in the record in support of these findings. 35 U.S.C.A. § 103(a).

9. Patents ⇐111

Reliance by Board of Patent Appeals on its assessment of what was basic knowledge, that communication in trusted environments was performed over trusted paths, and that verifying a trusted command in UNIX over a trusted path was nothing more than good common sense, not being based on any evidence in the record, was unwarranted, for purpose of patent application relating to method for improving security in computer systems; although Board could rely on its expertise as to peripheral issues, patentability could not be determined by such reliance. 35 U.S.C.A. § 103(a).

Linda Moncys Isacson, Associate Solicitor, Office of the Solicitor, U.S. Patent and Trademark Office, of Arlington, VA, argued for the Commissioner of Patents and Trademarks. With her on the brief were John M. Whealan, Solicitor, Kenneth R. Corsello and Thomas J. Finn, Associate Solicitors.

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Bruce M. Wexler, Fitzpatrick, Cella, Harper & Scinto, of New York, NY, for amicus curiae New York Intellectual Property Law Association. With him on the brief was Herbert F. Schwartz, Fish & Neave, of New York, NY.

Charles F. Schill, Foley & Lardner, of Washington, DC, for amicus curiae Federal Circuit Bar Association. With him on the brief were James A. Sprowl and Amy L. Wilsey. Of counsel on the brief were Michael E. Dergosits, President, George E. Hutchinson, Executive Director, and Rudolph P. Hofmann, Jr., Chair, Amicus Committee, Federal Circuit Bar Association, of Washington, DC.

Before PAULINE NEWMAN, Circuit Judge, ARCHER, Senior Circuit Judge, and MICHEL, Circuit Judge.

ARCHER, Senior Circuit Judge.

This case is before us on remand from the Supreme Court of the United States. *Dickinson v. Zurko*, 527 U.S. 150, 119 S.Ct. 1816, 144 L.Ed.2d 143, 50 USPQ2d 1930 (1999) ("*Zurko III*"). In *Zurko III*, the Court reversed our judgment and remanded the case because we had reviewed the factual findings of the Board of Patent Appeals and Interferences ("Board") for clear error, an incorrect standard of review.

The Board decision at issue, *Ex parte* Zurko, No. 94–3967 (Bd. Pat. Apps. & Int. Aug. 4, 1995), sustained the rejection of U.S. Patent Application No. 07/479,666 ("the '666 application") under 35 U.S.C. § 103 (1994). In our initial review of this decision, we determined that the Board's findings were clearly erroneous and we reversed. *In re Zurko*, 111 F.3d 887, 42 USPQ2d 1476 (Fed.Cir.1997) ("*Zurko I*"). At the Commissioner's suggestion, we then reheard this case en banc to reconsider the question of the appropriate standard of review. The Commissioner argued that Board findings should be reviewed under the standards of the Administrative Procedure Act (APA), namely the substantial evidence or arbitrary and capricious standard. 5 U.S.C. § 706 (1994). The en banc court held, however, that clear error was the correct standard of review for Board findings of fact and adopted the conclusions of the original panel decision. *In re Zurko*, 142 F.3d 1447, 46 USPQ2d 1691 (Fed.Cir.1998) ("*Zurko II*").

The Commissioner then petitioned for review by the Supreme Court, and the Court reversed, holding that Board findings of fact must be reviewed under the APA standards of review. The Court did not specify which APA standard of review to apply, substantial evidence or arbitrary and capricious. We subsequently decided this question in *In re Gartside*, 203 F.3d 1305, 53 USPQ2d 1769 (Fed.Cir.2000), and held that substantial evidence is the correct APA standard of review for Board factual findings.

We now revisit the merits of our decision in *Zurko I*, applying the proper APA standard of review. In doing so, we conclude that the outcome of this case does not change with the application of this new standard of review. Because the factual findings underlying the Board's decision are not supported by substantial evidence, we reverse.

BACKGROUND

The '666 application concerns a method for more efficiently creating a secure computer environment. Secure, or "trusted," computer environments employ trusted software designed to preclude unauthorized users and to prevent unintended or unauthorized commands. Such trusted software is often quite costly, compared to untrusted software, so it is desirable to minimize the amount of trusted software in the system. Applicants claim a method for processing trusted commands with a minimum of trusted software.

Representative claim one reads as follows:

> 1. A machine-executed method for executing a trusted command issued by a user on a computer system, the computer system including an untrusted computing environment and a trusted computing environment, said method comprising the steps of:
>
> (a) parsing the trusted command in the untrusted computing environment to generate a parsed command;
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> (b) submitting the parsed command to the trusted computing environment;
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> (c) displaying a representation of the trusted command to the user through a trusted path;
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> (d) receiving a signal from the user through a trusted path signifying whether the displayed representation accurately represents the user's intentions;
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> (e) if the signal signifies that the displayed representation does not accurately represent the user's intentions, then preventing the execution of the parsed command;
>
> (f) if the signal signifies that the displayed representation accurately represents the users intentions, executing the parsed command in the trusted environment.

As set forth in claim one, applicants' method involves processing and verifying a trusted command using both trusted and untrusted software. A trusted command is first processed by untrusted software to create a parsed command. The parsed command is then submitted to the trusted computer environment. Execution of this command requires verification along a trusted path. The parsed command is relayed to the user along a trusted path, and, if correct, the user can send a confirming signal back along this trusted path, allowing execution of the command. By processing a trusted command in this manner, the applicants contend they reduce the amount of trusted software. The applicants assert that the parsing step generally requires a large amount of software and that performing this step with untrusted software greatly reduces the amount of trusted code required to process a trusted command.

The Board sustained the Examiner's rejection of claims 1, 4, and 5 of the '666 application under 35 U.S.C. § 103 based on two prior art references. The primary reference is the UNIX operating system, as described in the applicants' information disclosure statement ("IDS"). According to this description, the UNIX system employs both untrusted and trusted code. Furthermore, certain commands in a UNIX system may be parsed in an untrusted environment, and then these parsed commands may be executed by "calling a trusted service that executes in a trusted computing environment."

The secondary reference, also described in applicants' IDS, is Dunford, FILER Version 2.20 ("FILER2"). This program

repeats back potentially dangerous commands, requesting confirmation from the user before execution.

Considering the teachings of these two references, the Board concluded that the invention claimed by the '666 application would have been obvious. The Board commented that "the artisan would have been led from these teachings to take the trusted command parsed in an untrusted environment and submitted to the trusted computing environment, as taught by UNIX, and to display the parsed command to the user for confirmation prior to execution, as suggested by [FILER2]." *Ex parte Zurko*, slip op. at 6–7. According to the Board, this combination would render the claimed invention obvious.

The Board also responded to applicants' arguments that neither reference discloses a trusted path communication to the user and that no teaching of the prior art references motivates the combination of these references to create the claimed invention. The Board said that communication along a trusted path, if not explicit in the prior art, is either inherent or implicit. *Id.* at 7. The Board further adopted the Examiner's assertion that "it is basic knowledge that communication in trusted environments is performed over trusted paths." *Id.* at 8. As for the motivation to combine these references, the Board concluded that it "would have been nothing more than good common sense" to combine the teachings of these references. *Id.* The Board noted that FILER2 taught the verification of dangerous commands in general, suggesting verification of the parsed command submitted to the trusted computing environment in UNIX. Because this verification occurs within a trusted environment, it is "basic knowledge," according to the Board, that this verification would occur along a trusted path. *Id.* at 7–8.

Reviewing the Board's decision in *Zurko I*, we held that "the Board's finding that the prior art teaches, either explicitly or inherently, the step of obtaining confirmation over a trusted pathway [was] clearly erroneous." *Zurko I*, 111 F.3d at 889, 42 USPQ2d at 1478. Indeed, we noted that neither reference relied upon by the Board taught communication with the user over a trusted pathway. *Id.*, 42 USPQ2d at 1479. We further held that the Board clearly erred in finding that the prior art teaches communicating with the user over both a trusted and an untrusted path. This finding was in conflict with the Board's other finding that trusted communications must be over trusted paths. *Id.* at 890, 42 USPQ2d at 1479.

On remand, applicants urge that we maintain our reversal of the Board's decision, arguing that the decision is legally flawed, or, alternatively, that the Board's factual findings fail under the APA standard of review. The Commissioner respond that we must affirm the Board decision because its findings are supported by substantial evidence in the record.

DISCUSSION

[1–3] A claimed invention is unpatentable for obviousness if the differences between it and the prior art "are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art." 35 U.S.C. § 103(a) (1994); *Graham v. John Deere Co.*, 383 U.S. 1, 14, 86 S.Ct. 684, 15 L.Ed.2d 545, 148 USPQ 459, 465 (1966). Obviousness is a legal question based on underlying factual determinations including: (1) the scope and content of the prior art, including what that prior art teaches explicitly and inherently; (2) the level of ordinary skill in the prior

art; (3) the differences between the claimed invention and the prior art; and (4) objective evidence of nonobviousness. *Graham*, 383 U.S. at 17–18, 86 S.Ct. 684, 15 L.Ed.2d 545, 148 USPQ at 467; *In re Dembiczak*, 175 F.3d 994, 998, 50 USPQ 1614, 1616 (Fed.Cir.1999); *In re Napier*, 55 F.3d 610, 613, 34 USPQ2d 1782, 1784 (Fed.Cir.1995) (stating that the inherent teachings of a prior art reference is a question of fact). We review the ultimate legal determination of obviousness without deference. *In re Dembiczak*, 175 F.3d at 998, 50 USPQ at 1616. We review factual findings underlying this determination for substantial evidence. *In re Gartside*, 203 F.3d at 1311–16, 53 USPQ2d at 1772–75.

[4, 5] Substantial evidence is "such relevant evidence as a reasonable mind might accept as adequate to support a conclusion." *Consol. Edison Co. v. NLRB*, 305 U.S. 197, 229, 59 S.Ct. 206, 83 L.Ed. 126 (1938); *see also Zurko III*, 527 U.S. at 162, 119 S.Ct. 1816, 50 USPQ2d at 1772–75. A review under this standard "involves an examination of the record as a whole, taking into consideration evidence that both justifies and detracts from the agency's decision." *In re Gartside*, 203 F.3d at 1312, 53 USPQ2d at 1773 (citing *Universal Camera Corp. v. NLRB*, 340 U.S. 474, 487–88, 71 S.Ct. 456, 95 L.Ed. 456 (1951)). In addition, "the possibility of drawing two inconsistent conclusions from the evidence does not prevent an administrative agency's finding from being supported by substantial evidence." *Consolo v. Fed. Maritime Comm'n*, 383 U.S. 607, 619–20, 86 S.Ct. 1018, 16 L.Ed.2d 131 (1966).

[6] The substantial evidence standard has been analogized to the review of jury findings, and it is generally considered to be more deferential than the clearly erroneous standard of review. *Zurko III*, 527 U.S. at 162–63, 119 S.Ct. 1816, 144 L.Ed.2d 143, 50 USPQ2d at 1936. The Supreme Court noted in *Zurko III*, however, that this generally recognized difference is "a subtle one," so fine that in its review of case law in the *Zurko III* decision, the Court could not find any other case where a reviewing court had conceded that the standard of review made a difference. *Id.* Moreover, while appellate courts must respect agency expertise, the Court has "stressed the importance of not simply rubber-stamping agency fact finding." *Id.* (citing *Universal Camera*, 340 U.S. at 477–78, 71 S.Ct. 456). Indeed, the Court observed that Federal Circuit judges "will examine [Board fact] findings through the lens of patent-related experience—and properly so, for the Federal Circuit is a specialized Court." *Id.* The Court further noted that this "comparative expertise, by enabling the Circuit better to understand the basis for the [Board's] finding of fact, may play a more important role in assuring proper review than would a theoretically somewhat stricter standard." *Id.*

With this guidance from the Supreme Court in mind, we now reconsider the Board's decision. Applicants urge that we reaffirm our conclusion in *Zurko I*, alleging numerous legal and factual errors in the Board decision. These arguments center around two issues. First, applicants argue that the prior art relied upon by the Board does not disclose one of the limitations of their claimed invention, namely communication between a trusted environment and the user along a trusted path. Second, applicants claim that there is no substantial evidence support for the Board's finding of motivation to combine the cited references to yield the claimed invention. We only need to consider the first issue raised by applicants.

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[7] As to this first issue, the Commissioner apparently concedes that neither the UNIX IDS disclosure nor FILER2 teaches communications between the user and the trusted environment along a trusted path. Nevertheless, the Commissioner maintains that the Board's findings concerning the content of the prior art are supported by four other references in the record.[1] The Commissioner argues that these additional references describe modified UNIX systems that allow communication over both trusted and untrusted paths. Therefore, the Commissioner argues, the Board's general findings concerning the content of the prior art have substantial evidence support, as does its ultimate conclusion of obviousness.

We are unpersuaded by the Commissioner's arguments. The Board's conclusion of obviousness was based on the UNIX and FILER2 references. The Board's findings with respect to these references simply cannot be supported by the alternative references identified by the Commissioner on remand. To the contrary, these alternative references merely confirm the well-known fact that conventional UNIX systems do not allow communication between the user and the trusted environment along a trusted path. For example, Johrie et al., U.S. Pat. No. 4,918,653, comments that "[s]ome examples of prior art multi-user operating systems which have not provided an effective mechanism for establishing a trusted path include UNIX...." Johrie, col. 1, ll. 60–63.

The Commissioner also cannot now mend the Board's faulty conclusion of obviousness by substituting these alternative references for those relied upon by the Board. This new combination of references would constitute a new ground for rejection, not considered or relied upon by the Examiner or the Board. It is well settled that it would be inappropriate for us to consider such a new ground of rejection. *In re Margolis*, 785 F.2d 1029, 1032, 228 USPQ 940, 942 (Fed.Cir.1986); *see also Koyo Seiko Co., Ltd. v. United States*, 95 F.3d 1094, 1099 (Fed.Cir.1996) (holding that "[t]he grounds upon which an administrative order must be judged are those upon which the record discloses that its action was based.") (quoting *SEC v. Chenery Corp.*, 318 U.S. 80, 87, 63 S.Ct. 454, 87 L.Ed. 626 (1943)).

[8, 9] Finally, the deficiencies of the cited references cannot be remedied by the Board's general conclusions about what is "basic knowledge" or "common sense" to one of ordinary skill in the art. As described above, the Board contended that even if the cited UNIX and FILER2 references did not disclose a trusted path, "it is basic knowledge that communication in trusted environments is performed over trusted paths" and, moreover, verifying the trusted command in UNIX over a trusted path is "nothing more than good common sense." *Ex parte Zurko*, slip op. at 8. We cannot accept these findings by the Board. This assessment of basic knowledge and common sense was not based on any evidence in the record and, therefore, lacks substantial evidence support. As an administrative tribunal, the Board clearly has expertise in the subject

1. Specifically, the Commissioner points to Johrie et al, U.S. Pat. No. 4,918,653; E.J. McCauley et al., *KSOS: The Design of a Secure Operating System*, Ford Aerospace and Communications Corp. (1979); Stanley R. Ames, Jr. et al., *Security Kernal Design and Implementation: An Introduction*, IEEE Cat. No. 830700–001 (July 1983); and Simon Wiseman et al., *The Trusted Path Between Smite and the User*, Proceedings 1988 IEEE Symposium on Security and Privacy (April 18–21, 1988).

matter over which it exercises jurisdiction. This expertise may provide sufficient support for conclusions as to peripheral issues. With respect to core factual findings in a determination of patentability, however, the Board cannot simply reach conclusions based on its own understanding or experience—or on its assessment of what would be basic knowledge or common sense. Rather, the Board must point to some concrete evidence in the record in support of these findings.[2] To hold otherwise would render the process of appellate review for substantial evidence on the record a meaningless exercise. *Baltimore & Ohio R.R. Co. v. Aderdeen & Rockfish R.R. Co.*, 393 U.S. 87, 91–92, 89 S.Ct. 280, 21 L.Ed.2d 219 (1968) (rejecting a determination of the Interstate Commerce Commission with no support in the record, noting that if the Court were to conclude otherwise "[t]he requirement for administrative decisions based on substantial evidence and reasoned findings—which alone make effective judicial review possible—would become lost in the haze of so-called expertise"). Accordingly, we cannot accept the Board's unsupported assessment of the prior art.

CONCLUSION

The Board's conclusion of obviousness was based on a misreading of the references relied upon and, therefore, lacks substantial evidence support. Accordingly, the Board's judgment is reversed.

REVERSED.

2. As described above, we cannot accept the Commissioner's invitation to now search the record for references in support of the Board's general conclusions concerning the prior art. Even if any such references could support these conclusions, it would be inappropriate for us to consider references not relied upon by the Board. *In re Margolis*, 785 F.2d at 1032, 228 USPQ at 942.

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